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Transactions of the Lincolnshire Naturalists' Union for 2009,
published 2010

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MAMMAL REVIEW AND ATLAS UPDATE: A CENTURY OF RECORDING, PROGRESS AND OPPORTUNITIES

Chris J. Manning

It was on moving to Lincolnshire in 1986 that I first learnt of the LNU, when I purchased a copy of the *Atlas of the Mammals, Reptiles and Amphibians of Lincolnshire and South Humberside* (Johnson, 1982) at the Lincolnshire Wildlife Trust's Gift Shop in Castle Square. This started a journey of discovery that culminated in the LNU publishing my own work on Deer and Deer Parks of Lincolnshire (2006).

Mammals have been the Cinderella of the LNU recording efforts, apart from the Preliminary List of the Lincolnshire Mammals (Blaythwayt, 1912) that contained the most comprehensive coverage until the publication of the Atlas. Exceptions include Monica Shorten's 1944-5 survey of grey and red squirrels which was undertaken for the War Agricultural Executive Committee (1946). The survey was undertaken by correspondence with each parish; their reports allowing distribution maps to be produced. The poor coverage required the LNU's input to complete the survey. Perhaps today the mixture of reports and records might be frowned on, but given the logistics of undertaking a county-wide survey it was perhaps the only practical method.

The Atlas was the Lincolnshire Naturalists' Unions most ambitious mammal survey, the field work was completed between 1975 and 1978. The logistics of such a survey were eased as in those days we still had a City and County Museum where Maurice Johnson worked as Assistant Keeper. The opening of the museum in 1907 was one of the LNU's earlier successes, it closure was a grievous blow, fortunately the records of those surveys survive, carefully guarded by successive mammal recorders and now lodged safely with the Lincolnshire Environmental Records Centre awaiting digitisation.

The most significant change in mammals recording since the publication of the Altas is for bats Chiroptera. Two factors have prompted the increased study and research that includes the formation of the Lincolnshire Bat Group. Firstly the advent of bat detectors from the 1960s, and the continuing improvement in the technology, started to make identifying bats by echolocation practical for the amateur naturalist. Secondarily their inclusion on Schedule 5 of the Wildlife & Countryside Act 1981, which gave protection to all bats and their roosts (earlier legislation gave protection to horseshoe bats only) led to licences being required to enter and survey bat roosts. The demand for licensed surveyors encouraged the Nature Conservancy Council (now Natural England) to promote the training and support of volunteer bat workers and the formation of Bat Groups, originally closely tied to the NCC, but since the early

1990s autonomous membership organisations. Today we have 11 species of bat in Lincolnshire; common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* (these species were only split in 1995), Nathusius pipistrelle *Pipistrellus nathusii,* barbastelle *Barbastella barbastellus*, Brandt's *Myotis brandtii*, brown long-eared *Plecotus auritus*, Daubenton's *Myotis daubentoni*, Leisler's *Nyctalus leisleri*, Natterer's *Myotis nattereri*, noctule *Nyctalus noctula* and whiskered Bat *Myotis mystacinus* (Faulkner, 2009). A full account of Lincolnshire's bats is in preparation by Annette Faulkner and will be published in a future edition of Transactions.

Vertebrate zoology coverage in Transactions was dominated by ornithology reports, these eventually led to the production of the Lincolnshire Bird Report and the formation of the Lincolnshire Bird Club. The Bird Club's Forums are a valuable source of records and thanks to their Chairman's help, I can contact members for verification purposes. Another electronic forum is our own Lincolnshire Wildlife News Bulletin, diligently edited by Roger Parsons with nearly 900 subscribers. Currently 6.5% (731) of our mammal records are from the Bulletin with the Lincolnshire Bird Club forums generating 3.7% (417) records.

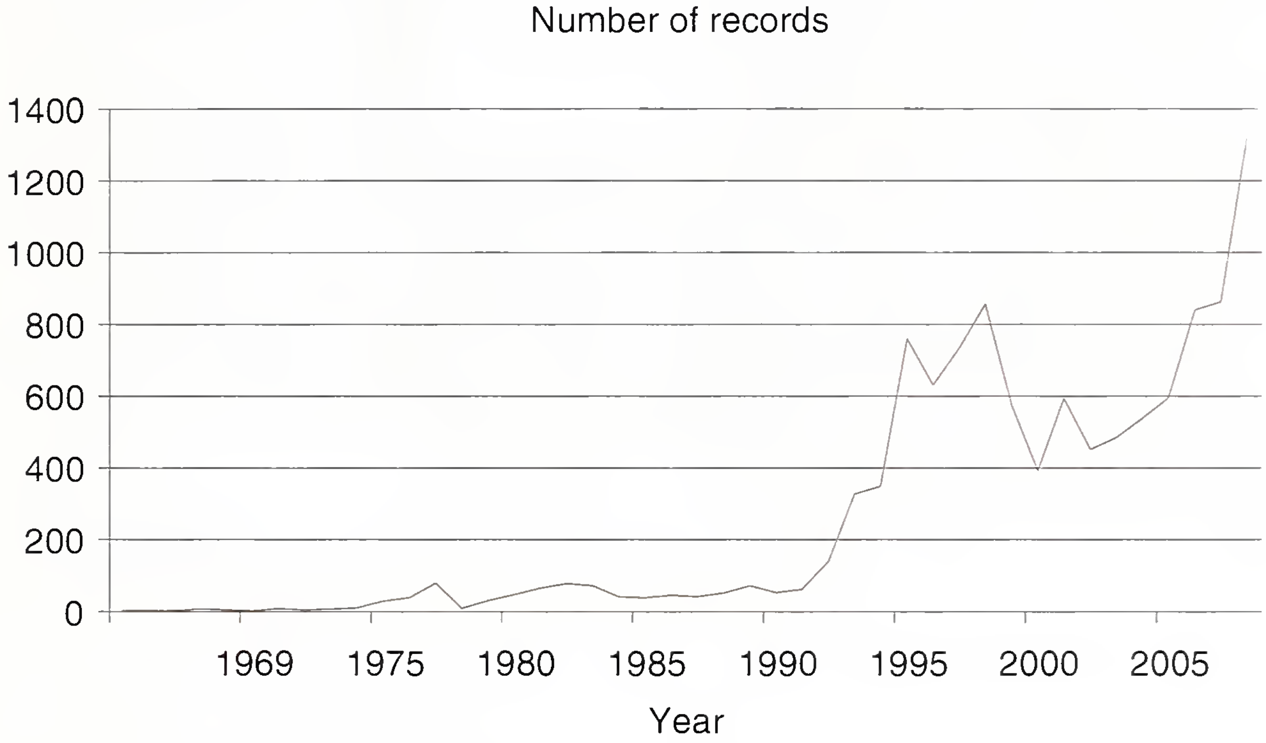
Ornithology surveys can yield valuable mammal data as shown by the Breeding Bird Survey (BBS). The BBS began in 1994, it is organised by the British Trust for Ornithology, Royal Society for Protection of Birds and the Joint Nature Conservation Committee. Participants have been voluntarily recording mammals as well as birds on their 1-km squares, making it the first multi-species, annual mammal survey to be carried out in the UK. BBS mammal recording focuses on large-sized easily identifiable species, although observers record any species seen or for which evidence of its presence was found (Davis *et al* 2007).

Another national survey is the Game Conservancy Trust's National Gamebag Census (NGC). The NGC was established in 1961 and collects bag statistics from about 650 estates or shoots each year and includes 19 mammal species, the data is statistically analysed and at the UK level shows significant medium-term (post-1960) changes in bags sizes for some species, although changes in game keeping practices may account for some of these.

The Breeding Bird Survey and the National Gamebag Census, are part of the Tracking Mammals Partnership (TMP). The TMP was formed by Joint Nature Conservation Committee in 2003 and aims to improve the quality, quantity and dissemination of information on the status of mammal species in the UK. TMP comprises 25 organisations, with reports regularly published on their web site.

The development of the Lincolnshire Environmental Record Centre will provide a safe repository for the LNU's records and enhance access to records as they are uploaded onto the National Biodiversity Network. As the Lincolnshire Environmental Record Centre develops, collating records from all sources we may initially see an optimistic picture of our county's mammals as the database increases in size. This is for the future, today the LNU's mammal records are virtually all our own work and thus comparable with the Johnson's Atlas (1982). What follows is largely an account of Lincolnshire's mammals over the last 35 years.

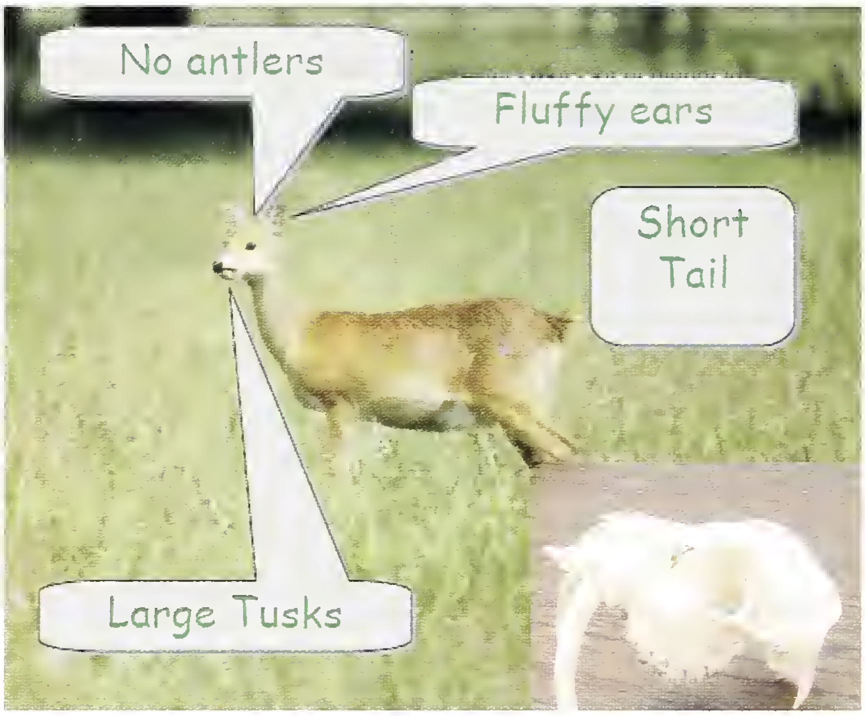
The LNU mammals database contained 11,326 records on 24th January 2010, when the analysis was started, but only since 1993 has the number of records exceeded 100 per annum.



The most active recorder is K.D. Robertson with 1,828 records. Only 13 recorders have submitted over 200 records and pleasingly eight are currently submitting records, with two more recently active having last submitted records in 2008. Most records are from sightings (8,024 records) with road casualties the second most frequent method (1,278 records) and the recording of mole hills (1,178 records) the third. Road casualties are responsible for 66.4% of badger records (442/666) and 61.4% of ferret records (12/44). Pleasingly no species then exceeds 13% with red fox 12.5% (106/851) and Chinese muntjac 12.2% (38/258). Our cats are responsible for 22.8% of the field vole records (31/136) and 18.3% of pygmy shrew records (11/60). For those species that we can compare, six have increased their distribution, 3 have reduced their distribution and pleasingly we have two new, non-bat species for the county.

Chinese water deer *Hydropotes inermis*

The Chinese water deer is our rarest wild deer, with a national population of less than 2,000 animals (Macdonald & Tattersall, 2001 cited in Battersby, 2005). They were first reported in the wild in 1945, and found mainly in East Anglia, with small isolated populations mainly in Cambridgeshire, Norfolk and Suffolk, occasional records in south Lincolnshire (NBN gateway) may well be the result of natural spread, but animals seen since 2004 at Gibraltar Point suggest a release, in eastern Lincolnshire.



Chinese water deer

The Chinese water deer is listed on the International Union for Conservation of Nature's Red List as a vulnerable species with the population declining due to poaching and habitat destruction (Harris, & Duckworth, 2008). Detailed current information on the population is not available, previously Wemmer, (1998) reported 10,000 animals in Asia so the English population may comprise over 20% of the world resource. It may be a prudent to maintain this introduced feral species in the UK as even on nature reserves in China habitat loss and fragmentation is resulting in isolated subpopulations (Harris and Duckworth, 2008). Initiatives such as the South Lincolnshire Fenlands Partnership will produce suitable habitats for this species that so far appears to have a benign impact on native biodiversity.

Hazel dormouse *Muscardinus avellanarius*

Blaythwayt (1912) reported the presence of hazel dormouse in the Wragby Woods but apparently they were already absent in the Kesteven Woods. When the dormouse became extinct in Lincolnshire isn't known, but no confirmed reports are available since 1912.

In 2002, 16 pairs of hazel dormouse were reintroduced to the Bardney Limewoods NNR. Careful monitoring has shown the population is thriving and they are expanding their range (Goodall, 2009). A further reintroduction is likely, but problematic in the Kesteven area where deer browsing has largely removed the shrub layer that provides the dormouse's habitat.

Chinese muntjac *Muntiacus reevesi*

Johnson (1982) recorded muntjac in only 3 x 10km squares, today they are present in 51, a 1,700% increase and our fastest spreading species based on distribution mapping. This expansion accords with the average gains of 12% per annum reported by the National Gamebag Census (Davey & Aebischer, 2009).

The expansion of muntjac distribution in Lincolnshire is partly due to deliberate releases (Manning, 2006) before they were added to Schedule 9 of the Wildlife and Countryside Act prohibiting their release. Muntjac have a postpartum oestrus so mature females are always pregnant or lactating, this can lead to a reluctance to cull them. With muntjac now distributed across Lincolnshire, increases in density are likely, especially in the south west were they can exploit any increase in the shrub layer that is currently suppressed by large numbers of fallow deer.

Roe deer *Capreolus capreolus*

The native roe deer is our second most successful species based on distribution mapping increasing from only 8 x 10km squares Johnson (1982) to 64 today, a 700% increase. This mirrors the national picture with a long-term increase over last 25 years and a continued increase in last 10 years (TMP, 2008).

The colonisation of Lincolnshire by roe deer since 1969 mirrors the national trend due to the spread of native roe from Scotland and introductions (Manning, 2006). The 19th century introductions in Dorset, Sussex and Suffolk (Elveden) (Prior, 1995) were probably of continental stock, these and the Scottish population are now meeting in Lincolnshire. Roe deer are widespread in Lincolnshire, but most records (232) are for North Lincolnshire (vice-county 54) with only 73 for South Lincolnshire (vice-county 53).

Badger *Meles meles*

Blaythwayt (1912) considered that badger numbers In Lincolnshire were increasing, particularly in the northern part of the Lincolnshire Wolds. Badger numbers continue to increase from 38 x 10km squares Johnson (1982) to 70 today, an 84% increase, again mirroring national trends. Battersby (2005) states that the use of field signs is a reliable way to monitor badger populations, yet in Lincolnshire most records are due to road traffic accidents.

Otter *Lutra lutra*

The otter has increased in Lincolnshire from 21 x 10km squares (Johnson, 1982) to 32 today, a 52% increase. When the nadir of the otter's distribution was reached in Lincolnshire isn't known, possibly the population was still declining when Johnson (1982) produced the Atlas. Did they become extinct?

Before the subsequent releases Green (1999) reported on surveys on the Great and Long Eau, the whole length of the River Lymn and the Bain from its source to Horncastle and concluded 'otters have never been entirely absent from this part of Lincolnshire during the period of decline'. Percival (1999) reported otter signs (tracks and spraint) in 1996 at Horkstow (SE973177), Saxby All Saints (SE982168), Land Rain Farm Bridge (SE985162) and North

Kelsey Beck (TA490031). These reports suggest that the otter was never extinct in Lincolnshire. Never-the-less introductions did take place:

Releases:

The Otter Trust. (Shuter, 1999),
Gwash (just below Rutland Water) May June 1994 (1x ♂ 2x ♀?), breeding confirmed in August 1995 and January 1997.

Welland (a few kilometres upstream of Stamford) July – Sep 1994 2/2 (2x ♂ 2x ♀?) breeding confirmed in July 1995, Nov. 1996, Jan. 1997, April 1997 and Jan. 1998.

The Vincent Wildlife Trust (Green, 1999),
Bag Enderby October 1994, 2x ♂ 1x ♀ breeding confirmed in 1995.

Little Steeping October 1994, 2x ♂.

Mavis Enderby October 1994,1x ♂ 2x ♀, breeding confirmed in 1995.

Broughton (Lodge Farm Estate) October 1995, 1x ♂ 2x ♀, plus 3x ♂ later.

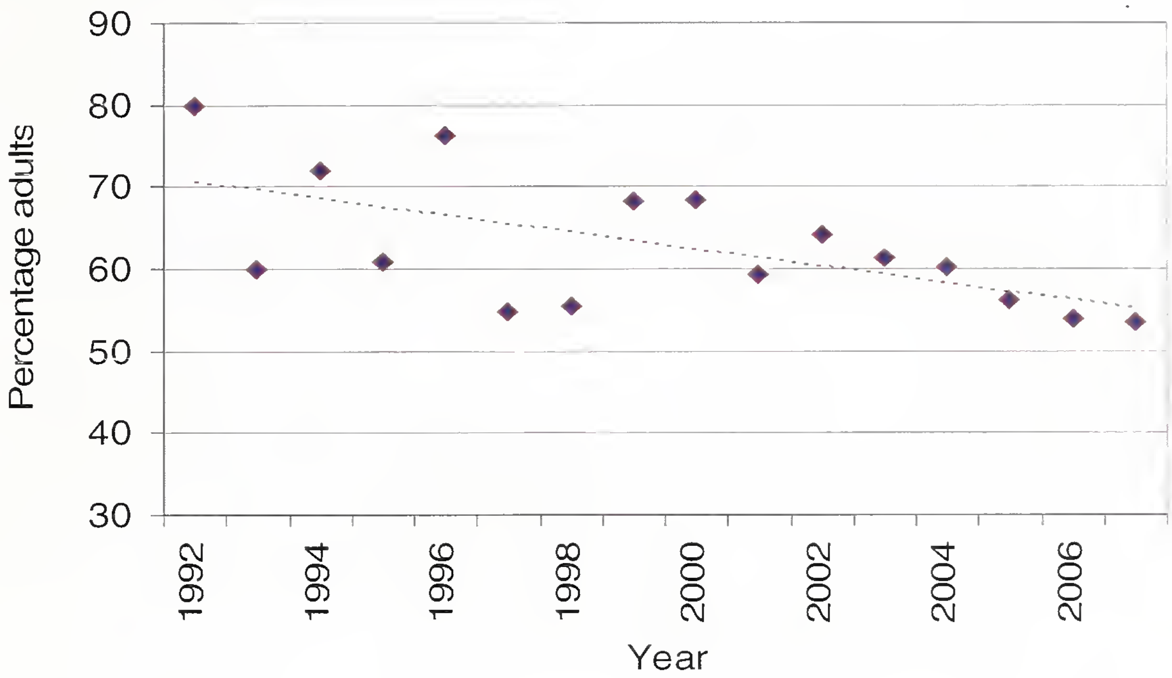
Scotterthorpe, May 1996, 1x ♂ 1x ♀.

Broughton (Lodge Farm Estate) May 1996, 1x ♂ 1x ♀.

Surveys by the Vincent Wildlife Trust in 1995 and 1996 showed otters present 'along the entire length of the Ancholme, on parts of the Trent, the Eau and at the ponds at Barton upon Humber' (Green, 1999). In contrast 'no signs were found' in the Grimsby and Ancholme area during the 2000-02 Otter Survey (Crawford, 2003).

The Environment Agency has funded research via post-mortem examination of dead otters since 1992. The initial impetus for this study was the potential link between the dramatic decline of otter populations in the 1950s and 1960s, and pollutants such as PCBs and organochlorine pesticides. Liver samples retained at post mortem are analysed and form a long-term record of pollutants (Chadwick, 2010). The research includes landscape genetics, diet, ectoparasites and endoparasites. The latter include the gall fluke *Pseudamphistomum truncatum* first found in Britain in 2005 in otters and mink from Somerset Levels, it is thought to have been introduced with fish from Eastern Europe (Chadwick, 2010).

Encouragingly the demographic profile as judged by road traffic causalities shows more young animals indicating an expanding population.



(from Chadwick, 2007)

Anyone who finds a dead otter should contact the Environment Agency with the time, date and location found and their contact details (0800 807060 – 24 hour incident hotline).

Red deer *Cervus elaphus*

Red deer distribution has increased from 8 x 10km squares Johnson (1982) to 11 today, a 37% increase. This compares with the reported national trends of a long-term increase over last 25 years, but with stable populations over the last 10 years (TMP, 2008).

The increased distribution is due to occasional records such as Oliver Burkett's 1996 record from Withern that was confirmed with photographic evidence, this shows two young stags both with signs of ear tags identifying them as escapees. In this case interpretation of a single record falsifies the distribution map due released/escaped animals.

The population for TA01 (Worlaby Carrs) in 1998 included details of the population from Robert Young's report: stags 1 x mature, 4 x immature, 11 hinds and 5 calves. This strongly suggested a breeding group, with the count taken when the animals were outside the fence of Elsham Hall Gardens and Country Park that in those days kept a small number of red deer. The population probably originated from deer farming escapees (Manning, 2006). The lack of recent records suggesting they are now extinct.

Red deer have been reported breeding on Thorne, Crowle and Goole Moors since at least 1996 (Jones, *et al* 1996). Regular records to the present day suggest a established population with the National Nature Reserve their core area.

Grey squirrel *Scurius carolinensis*

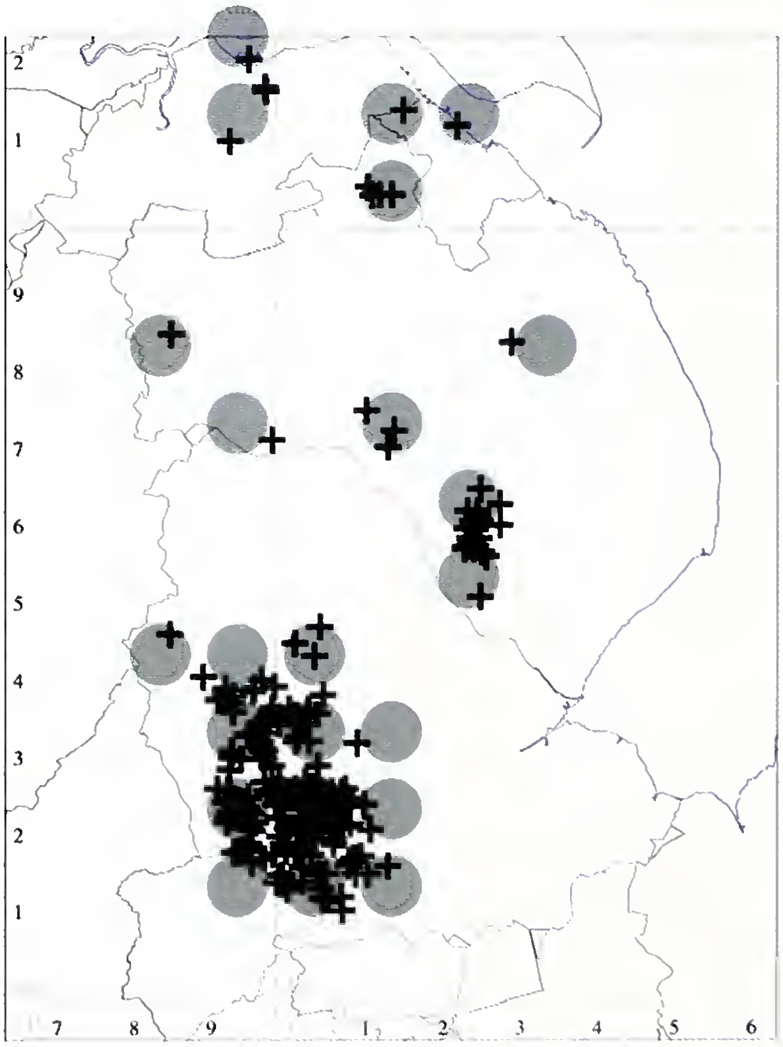
Grey squirrels have been present in Lincolnshire since 1935, when they were first recorded at Folkingham and then at Leasingham. By 1937 they were also present at Quarrington, Tallington, Uffington, Belton Park, Swinethorpe Castle and Sedgebrook (Shorten, 1946). The first record north of the Witham was at Coningsby in 1944 and at Lincoln a year later (Shorten, 1946).

Grey squirrel have continued to increase from 27 x 10km squares in (Shorten) 1946, 63 x 10km squares Johnson (1982) to today's records for 73 x 10km squares, a 15.9% increase since the publication of the Atlas. Nationally the grey squirrel has show a long-term increase over last 25 years, with a more rapid increase in last 10 years (TMP, 2008). The grey squirrel usually causes concern due to the squirrel parapoxvirus virus they carry that may be a significant component in the decline of the red squirrel *Scurius vulgaris* (Tompkins, *et al.* 2002).

Fallow deer *Dama dama*

Having recorded expansion in the range of roe and muntjac deer, it is perhaps surprising to report a decrease in the distribution of fallow deer from 26 x 10km squares Johnson (1982) to 23 today, an 11% decrease. This is due to fewer records in central Lincolnshire,10 km distribution can be influenced by a single record such as a road casualty on the Lincoln bypass in October 2007. Fallow, as with other deer, are occasionally seen in unusual locations, these may be

Fallow deer
+ single record
● 10km sq record



wandering wild animals or escapees from parks and collections. In mapping distribution at the 10km level, caution should be used when this is based on a single record, although for specific sites such as Read's Island, a single cross represents numerous records.

Nationally Davis (*et al* 2007) did report for fallow deer 'no significant change in abundance in between 1995 and 2005', this may be due to the survey method used in BBS or have fallow deer finally responded to a concerted effort to reduce numbers? In south Lincolnshire, the results of three years thermal imaging surveys do suggest numbers have declined (Jones, 2009). These coincide with reports presented at the South Lincolnshire Deer Group Management Unit meeting in May 2009 with most attendees noting reduced numbers of deer.

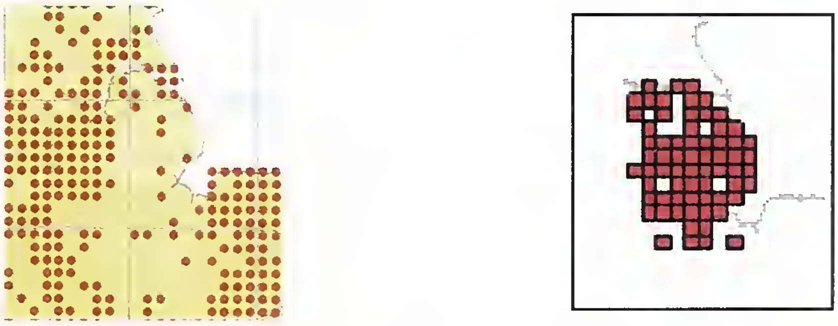
A variety of deer census techniques for deer have been documented (Mayle, *et al* 1999) and these can be grouped as direct counts, indirect methods based on faecal pellet groups or tracks and the reconstruction of past populations from cull data. Direct counts can also be undertaken at night using thermal imaging, this uses the long-wave radiant energy emitted by warm-blooded animals and their surrounding habitat with surface temperature differences shown as varying degrees of brightness in the viewfinder (Gill, 2010). The equipment won't work in cover as it relies on line-of-sight, advanced kit designed for military use is more useful for survey work, with typical costs of >£30,000 for a thermal imaging binocular.

The thermal imaging transacts undertaken in south Lincolnshire are at an early stage and until undertaken in a systematic way using transacts cannot be expected to provide a reliable assessment of the population.

Water vole *Arvicola amphibius*

Water voles have decreased from 78 x 10km squares Johnson (1982) to 53 today, a 38% decrease, this is slightly better than national trends that show declines of more than 50% (Battersby, 2005), however long term monitoring in Lincolnshire (Kite, 2008) has shown a decline in water vole numbers.

Water Vole Distribution in Lincolnshire



2006
(Strachan & Moorhouse with permission of University of Oxford)

2000-2010
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The water vole was shown as virtually absent in Lincolnshire in 2006 when Strachan and Moorhouse published the *Water Vole Conservation Handbook* (2006). This absence of records Lincolnshire was just before the establishment of the Lincolnshire Environmental Records Centre that uploaded its first records onto the National Biodiversity Network's Gateway in October 2009. These show a widespread distribution that is due in part to the collation of a larger data base.

Harvest mouse *Micromys minutus*

The final species that we can show a change in distribution for is the harvest mouse that has decreased from 55 x 10km squares Johnson (1982) to 21 today, a 38% decrease. Nationally harvest mouse are thought to be declining (Battersby, 2005) with Lincolnshire appearing to follow the national trend.

The harvest mouse was described as 'rare' in Lincolnshire by Blathwayt (1912), with the next record a skull found in a barn owl pellet from South Carlton in 1968 (Johnson, 1969). This prompted Maurice Johnson to study the harvest mouse, undertaking the analysis of numerous barn owl pellets that also provided numerous small mammal records for Lincolnshire. Hopefully the apparent decline in the harvest mouse is due to reduced recording effort, a study on Vernatts Drain has shown that numbers fluctuate widely on a site were management is targeted for this species (Faulkner, 1996 & 1998).

Field Vole	1,240
Common Shrew	539
Wood Mouse	269
Bank Vole	171
Brown Rat	91
Pygmy Shrew	76
Water Vole	34
Harvest Mouse	31
House Mouse	30
Water Shrew	15
Mole	2
Rabbit	2
Whiskered Bat	1
Birds	149
	2,650

(Johnson, 1969)

Johnson (1982) combined the distribution map for the common and pygmy shrew *Sorex araneus/minutus* while other small mammals such as the bank vole *Clethrionomys glareolus* and field vole *Microtus agrestis* he considered widespread. Today the only evidence for the widespread of these species is the large number of barn owls *Tyto alba* with Lincolnshire holding around 10% of the national breeding populations due to the widespread installation of nest boxes. We have no records of yellow-necked *mouse Apodemus flavicollis* hopefully Johnson's (1982) statement that this species is under recorded in Lincolnshire is hopefully still true. Other than barn owl pellets and trapping, surveying for water shrew *Neomys fodiens* can also be undertaken using bait tubes as they feed on aquatic invertebrates that can be detected in the scats (Environment Agency, 2006).

Bank and field voles from barn owl cache, Austen Fen West
Photo C. Manning

Disappointingly population trends for Biodiversity Action Plan species such as hedgehog *Erinaceus europaeus* and brown hare *Lepus capensis* can't be determined with the current database, although both species have a widespread distribution across the county.

References

BATTERSBY, J. Editor, 2005. *UK Mammals: Species Status and Population Trends First Report* by the Tracking Mammals Partnership, JNCC.
BLAYTHWAYT, Rev, F. L. 1912. Mammalia of Lincolnshire, Lincolnshire Naturalists Union, *Transactions Volume 3 Part 1.*
CHADWICK L. 2007. Otter Road Show presentation Environment Agency.
CHADWICK, L. 2010. *Cardiff University Otter Project*, http://www.otterproject.cf.ac.uk/ accessed 25th April 2010, University of Wales, Cardiff.
CRAWFORD, A. 2003. *Fourth Otter Survey of England 2000-2002*, Environment Agency.
DAVEY, P.A. AEBISCHER, N J.2009. *Participation of the National Gamebag Census in the Mammal Surveillance Network*, A report to JNCC for the year 2008/09, The Game & Wildlife Conservation Trust.
DAVIS, S. E. NEWSON, S. E. NOBLE, D. G. 2007. BTO Research Report No. 462 *The production of population trends for UK mammals using BBS mammal data: 1995-2005 update.* A report by the British Trust for Ornithology under contract to the Joint Nature Conservation Committee.
CARTER, P. CHURCHFIELD, S. , 2006. *Distribution and habitat occurrence of water shrews in Great Britain*, Environment Agency Science Report SC010073/SR.

FAULKNER, A., 1996. Harvest mice at Vernatts Nature Reserve Spalding, *Transactions, Vol 24 Part 1*, Lincolnshire Naturalists Union.
FAULKNER, A., 1998. Harvest mice at mice at Vernatts Nature Reserve An Update, *Transactions, Vol 24 Part 4*, Lincolnshire Naturalists Union.
FAULKNER, A., pers. Comm, 2009. Lincolnshire's Bats.
Gill, R. 2010. *About using thermal imaging*, Forest Research http://www.forestresearch.gov.uk/fr/infd-6chca4 accessed 14 April 2010.
GOODALL, A. 2009. Hazel Dormouse Reintroduction In Lincolnshire. *Transactions, Vol 27 Part 2*, Lincolnshire Naturalists Union.
GREEN, R. 1999, pers com E.J. Redshaw (Lapwings Consultants) on behalf of The Vincent Wildlife Trust.
HARRIS, R.B. & DUCKWORTH, J.W. 2008. Hydropotes inermis. In: IUCN 2010. IUCN *Red List of Threatened Species. Version 2010.1.* www.iucnredlist.org.
JOHNSON, M. 1982. Atlas of the Mammals, Reptiles and Amphibians of Lincolnshire and South Humberside, Lincolnshire Naturalists' Union.
JONES, G. 2009. South Lincolnshire Deer Management Area, unpublished papers presented to The South Lincolnshire Deer Management Unit in May 2009.
JONES, M. ROTHERHAM, I. D. MCCARTHY, A, J. editors. 1996. *Deer or the New Woodlands?* Wildtrack Publishing.
KITE, N. 2008. Drawing Some Conclusions From The Environment Agency's Water Vole Monitoring In Lincolnshire, *Transactions, Vol 27 Part 1*, Lincolnshire Naturalists Union.
MANNING, C. J. 2006. *Deer and Deer Parks of Lincolnshire*, Lincolnshire Naturalists Union.
MAYLE, B. A. PEACE, A. J. GILL. R. M. A. 1999. *How Many Deer? A Field Guide to Estimating Deer Population Size*. Forestry Commission, Edinburgh.
PERCIVAL, K. 1999, pers com E.J. Redshaw (Lapwings Consultants) on behalf of North Lincolnshire Council.
PRIOR, R. 1995. The Roe Deer Conservation of a Native Species, Swan Hill.
SHORTEN, M. 1946. The Distribution of the Grey Squirrel (*Scurius carolinensis Gmelin*) and The British Red Squirrel (S. *vulgaris leucourus* KERR) in Lincolnshire. *Transactions, Vol 11 Part 3*, Lincolnshire Naturalists Union.
SHUTER, R. 1999, pers com E.J. Redshaw (Lapwings Consultants) on behalf of The Otter Trust.
TMP, 2008. *Tracking Mammals Partnership Update 2008*, Tracking Mammals Partnership.
TOMPKINS, D. M. A. SAINSBURY, . W. NETTLETON, P. BUXTON, D. and GURNELL, J. 2002. *Parapoxvirus Causes a Deleterious Disease in Red Squirrels Associated with UK Population Declines*, The Royal Society.
WEMMER, C. (editor), 1998. *Deer, Status Survey and Conservation Action Plans*, International Union for the Conservation of Nature and Natural Resources, SSC Deer Specialist Group.
WOODROFFE, G.L., LAWTON, J.H., & DAVIDSON, W.L. 1990b. The impact of feral mink Mustela vison on water voles *Arvicola terrestris* in the North Yorkshire Moors National Park. *Biological Conservation, 51: 49-62.*

Presidential portrait - Chris J Manning CEnv MIEEM BSc (Hons.)

Photo I. MacAlpine-Leny

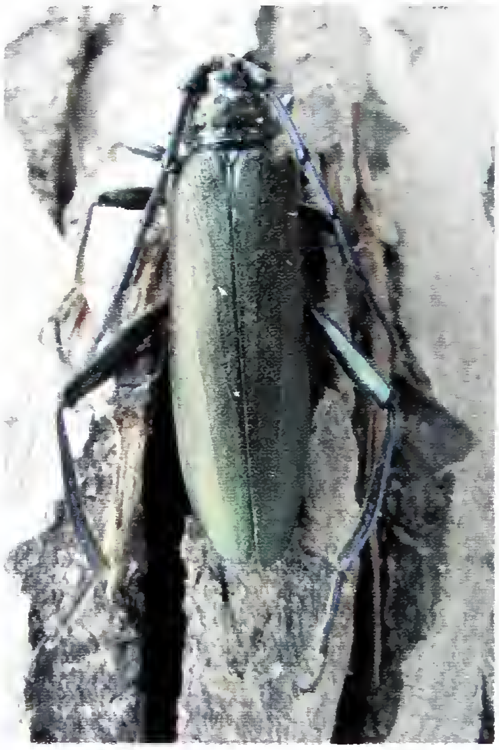
Chris Manning was born in Norfolk in 1957 and first became interested in wildlife after a schoolboy visit to London Zoo when he spotted wild deer on the East Anglian Brecklands. On moving to Lincolnshire in 1986 he started researching the county's deer, this eventually resulted in the LNU publishing Deer & Deer Parks of Lincolnshire in 2006.
It was shortly after moving to Lincolnshire that Chris joined the Lincolnshire Wildlife Trust and started volunteering on nature reserves. Later he worked for the Trust as the project officer for the Protected Roadside Verges Scheme before as a mature student he completed a BSc in Landscape Ecology.

Since graduating Chris has worked as project manager for the Humber Management Scheme and since 2006 as Environmental Officer for Lindsey Marsh Drainage Board. Chris initially collected deer records for his study of Lincolnshire's deer, completing the millennium distribution maps for the British Deer Society. Chris was the LNU representative on the working group that established the Lincolnshire Environmental Records Centre, he has been the LNU mammal recorder since 2007 and has recently completed his second term as President.

TWO UNUSUAL BEETLES

Allan and Annette Binding

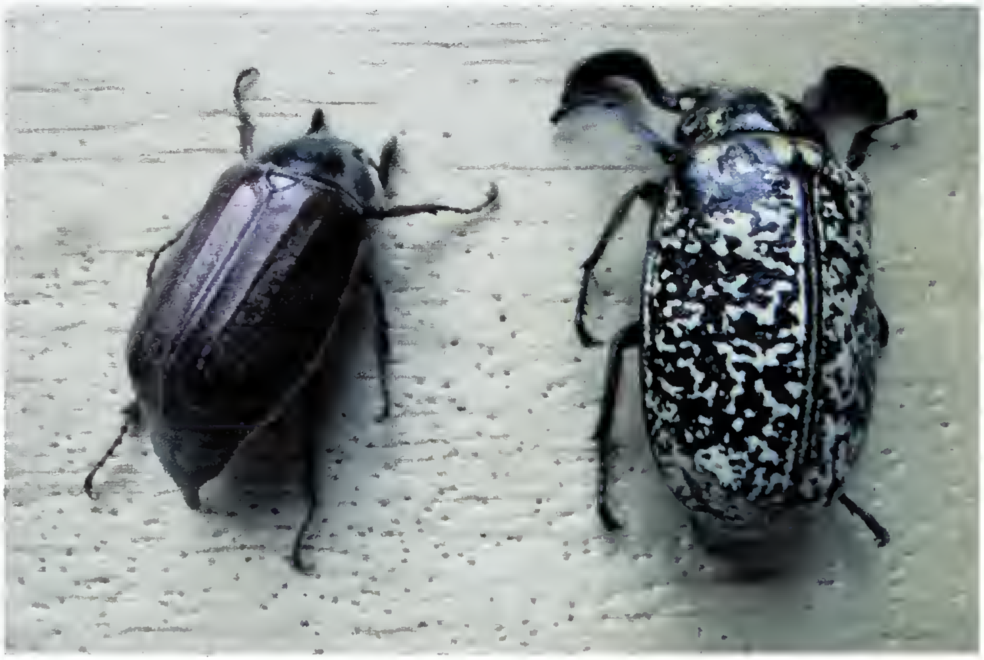
In 2009 we received two very interesting beetles which had been taken to the Lincolnshire Wildlife Trust headquarters in Horncastle for identification.



Musk beetle Photo A. Binding

The first one was a British species, the musk beetle *Aromia moschata* which had been found on willow in a Coningsby garden on the 26th June and was passed on to us by Dave Bromwich. The beetle has been recorded in several locations in the county but this was a new site record. Around the same time we received two photographs of the musk beetle taken just out of the county at Staythorpe Power Station on the banks of the River Trent in Nottinghamshire. Nottinghamshire Biological Records Centre told us that they had received quite a few records of the musk beetle in recent years found on the banks of the River Trent.

The second interesting species received in August via Rachel Shaw at Lincolnshire Wildlife Trust was a pine chafer *Polyphylla fullo*. This species is not normally found in Britain. The beetle, which is much larger than the common cockchafer *Melolontha melolontha*, was found in the luggage of a family who had returned from a camping trip to France.



Cockchafer (L.) and pine chafer beetle (R.) Photo A Binding

THE PLANTS OF WHISBY NATURE PARK – A SELECTION OF INTRODUCED NEOPHYTES AND NATIVE SPECIES

Phil Porter

During, and in some cases prior to, its 20 year history as a high-profile public amenity and eventually Local Nature Reserve, Whisby Nature Park has yielded records of 546 species of plants. During this time the site has been rebounding from the virtual destruction of its agricultural vegetation cover by the 1970's and the sudden imposition of numerous water-bodies of various sizes. Combined with the wide range of moisture-holding characteristics and also pH value in the substrate, these conditions have led to a very rapid series of plant colonisations, which seems by the end of the first decade of the 21st century to be finally slowing down, although of course the flora is still very far from achieving a climax. The soils left behind by vigorous churning in torrents derived from retreating ice of 10,000 years ago have been stripped of a fair proportion of their sand and gravel by quarrying, leaving behind an enhanced, poorly drained clay constituent. On the other hand, in the vicinity of the processing areas, pure sand and gravel substrates still persist, and on top of that, there are also pockets of high pH value where concrete rubble was discarded by the quarrying companies and more recently Lincolnshire Wildlife Trust has imported thousands of tonnes of limestone to provide path surfaces.

It is in the nature of a gravel pit complex to be subject to colonisation by native and neophyte plant species brought in directly by human agency and this fact obscures a sharp definition between species truly native to the site and those which would have been unlikely to have reached it by natural means. Vectors will include soil in the tracks and wheels of machinery and especially the import of bulk materials from outside as former gravel pits have often been considered fair game for some judicious unofficial dumping of garden materials or worse. Sometimes 'top-soiling' might be carried out. All these practices will introduce new species.

Another direct influence would be the deliberate planting of species by unknown hand to enhance the landscape or the habitat. This probably happens rather rarely, but Whisby examples would be a range of bulbous monocotyledons such as daffodils *Narcissus* (thankfully resembling the native species), snowdrops *Galanthus* and bluebells *Hyacinthoides non-scripta*. A couple of bizarre plantings mysteriously carried out in woodland have left us with box *Buxus* sp. and cyclamen *Cyclamen hederifolium*. Somehow galingale *Cyperus longus* has found its way into Thorpe Lake presumably as a throw-out from a garden pond. This native of the far south-west of England can be bought in some garden centres and would have been too vigorous for any normal garden pond.

Native water plants deliberately introduced to enhance the diversity include the striking great water dock *Rumex hydrolapathum* and water-violet *Hottonia* *palustris* which both arrived from the former Burton Pits Lincolnshire Wildlife Trust reserve. The latter species is now a conspicuous element of the Orchid Glade pond, which also plays host to a Lincolnshire Wildlife Trust attempt to create a refuge locality for the endangered great water parsnip *Sium latifolium.* Seed gathered from wild plants in the county were raised and young plants transplanted into a number of sites including several at Whisby. Unfortunately the Orchid Glade was the only place where the Whisby plantings survived. In many ways this was not surprising as the water's-edge substrate is rather low in organics below the top few inches, unlike the fens in which the plants are native, but a few natural seedlings are now starting to appear.

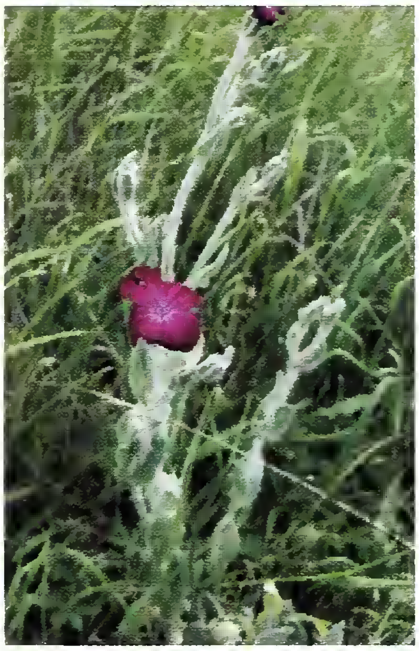
These days of course conservation bodies are paid to introduce seed to potentially rich grasslands in order to fulfil stewardship prescriptions without waiting for the species list to increase naturally. I regret this in many ways, not only because this management is frequently disappointing for the effort involved, but also because even if it does succeed, I am purist enough to be less thrilled by the contrived outcome when compared to a spontaneous succession, however long it may take. This is just as well, because several of my favourite plants which seed mightily in our wildlife garden at Bardney could so easily become 'Whisby plants'. I have to admit I am particularly tortured by two species which have failed having always been tenuous at Whisby and which I could so easily replace using seed from the garden; marsh marigold *Caltha palustris*, a particular favourite of mine and hemp-agrimony *Eupatorium cannabinum,* which is of course a strong insect attractor. I console myself with the thought that if I weakened enough to throw some seed around, what might be next?

Peach-leafed bellflower and garden lady's mantle
Photo P. Porter

One species which I may have been responsible for unwittingly introducing was peach-leafed bellflower *Camapanula persicifolium.* This potentially striking and tall bellflower only appeared once as a thoroughly rabbit-chewed individual, and as it germinates freely in our garden, the seed could have arrived off my clothing. I have noticed that a few plants are established at nearby Tunman Wood. Other people will have been responsible for the altogether more distressing occurrence of pirri-pirri bur *Acaena sp.* to the bone-dry areas of Plover Beach. This carpeting or ground-cover plant, having escaped from the horticultural trade, spreads itself with hooked seeds, and has caused some difficulty at LWT reserves in the Woodhall Spa area. The roots of this plant are like wire and the creeping stems root readily.

Unless it is controlled it has shown itself to be capable of smothering other plants of a similar stature.

These two species illustrate the important difference between those non-native species which become established and those which ultimately fail. Some highly successful colonisers at Whisby have included alsike clover *Trifolium hybridum,* garden lady's mantle *Alchemilla mollis*, buddleia *Buddleia davidii* and evening-primrose *Oenothera biennis* but many, many more have appeared and failed to a certain degree, either disappearing altogether or else becoming confined to a very restricted area. Examples of short-stayers would be milk thistle *Silybum mariana*, Oxford ragwort *Senecio squalidus* (surprisingly), spring beauty *Montia perfoliata,* white melilot *Melilotus albus,* spearmint *Mentha spica* and feverfew *Tanacetum parthenium.* Plants which persist but have become 'stuck' in a few places where they have been found over a long period without spreading elsewhere include horse-radish *Armoracia rusticana,* green alkanet *Pentaglossis sempervirens,* ground-elder *Aegopodium podagraria,* orange hawkweed *Pilosella aurantiaca,* periwinkle *Vinca major* and strikingly rose-campion *Lychnis coronaria* which is so lurid in colour as to seem almost impossible to photograph satisfactorily; rabbits in particular seem to like the *Lychnis*, preventing it from flowering in many years.



Rose campion Photo P. Porter

Tree or hedgerow planting for screening purposes prior to conservation management can easily bring in non-native species and at least three regular pests at Whisby were introduced to do this very specific job during the quarrying stage in the site's history. Famed for their ability to grow in the poorest of soils, sycamore *Acer pseudoplatanum*, Italian alder *Alnus cordata* and grey alder *A. incana* all now require severe controlling to avoid them becoming a far more prominent aspect of the flora than any of their supposedly favourable points could possibly justify. Grey alder in particular, is a suckering nightmare and some of these have reached such proportions that chemical treatment of the trunk fails to control the suckers. Unfortunately sheep seem to be largely unimpressed with their gastronomic attributes beyond nipping off the tips. Another woody non-native which causes us actual management problems, Himalayan

Himalayan cotoneaster Photo P. Porter

cotoneaster *C. simonsii* is starting to outgrow its station along one of the paths. Its relatives *C. horizontalis* and *C. bullatus* can also be found in odd places but are not spreading.

Like it or not, neophytes are here to stay and I believe that the current Botanical Society of the British Isle's Atlas may now contain more of them than accepted native species. A small instance caught my eye in Bardney during 2009 when self-sown lavender *Lavendula sp.* pushed up through cracked pavement tarmac at the base of a garden wall. I am not sure how often this happens at the moment but it struck me as unusual. The plant also survived the 2009/10 winter without turning a hair. Climate change will probably make this proportion greater. If we happen to inherit a Mediterranean-type climate in the future, many of the characteristic plants will not have to make the journey naturally; they will already be here in our gardens ready to escape!

THE BEES (HYMENOPTERA: ACULEATA) OF WATSONIAN LINCOLNSHIRE. ANTHOPHORINE OR NOMAD BEES (NOMADA, ANTHOPHORA, MELECTA AND XYLOCOPA)

Michael Archer

This is the fifth paper on the bees of Lincolnshire and deals with the solitary bees of the family Apidae. An introduction to these bees can be gleaned from Nixon (1954), Andrewes (1968), O'Toole & Raw (1991), Weiss (2002) and Michener (2007). Else (in preparation), when published, will be the standard book on the British bees dealing with the natural history of each species in detail besides giving illustrated keys to all the species. The current major sources of species information are the Provisional Atlases of the Bees, Wasps and Ants Recording Society (BWARS). These provide a national distribution map and detailed natural history information for each species. These Atlases are not complete, but the relevant one will be indicated as each species is considered.

This paper considers 264 records of 18 species where a record represents a specimen differing in one of the following three variables: name, sex and day-date of capture or observation. These records were made by 25 recorders from 55 sites. The recorders were: M.E. Archer (MEA), J. Bills (JB), H. Britten (HB), B. Bushby (BB), G. Culpitt (GC), A. Dale (AD), A. Faulkner (AF), J.P. Flynn (JPF), C.F. George (CFG), A. Godfrey (AG), R. Goy (RG), M.W. Graham (MWG), S.J. Hayhow, S.J. (SJH), D.S. Hill (DSH), W.G. Hoff (WGH), H.P. Jones (HPJ), A.S. Lazenby (ASL), G. Marsden, (GM), E.A. Peacock (EAP), A.L. Phillips (ALP), P. Porter (PP), J. Roussean (JR), S.R. Sowden (SRS), M. Tyszka (MT), R.W.J. Uffen (RWJU). The sites with grid references and Natural Areas (Weaver, 1988) are given in the appendix. The sites are distributed among the Natural Areas (Weaver, 1997) as follows: North Lincolnshire Coversands & Clay Vale (19 sites), Lincolnshire Coast & Marshes (13), Lincolnshire Wolds (11),The Fens (5), Urban (5), Trent Vale & Rises (4), Lincolnshire & Rutland Limestone (2), and Humberhead Levels (1).

For each species the records are given in site alphabetical order. Abbreviations are used for the following sites: Gibraltar Point (GP), Grantham (GR), Kirkby Moor (KM), Kirton-in-Lindsey (KL), Manton & Twigmoor (MT), Messingham Sand Quarry (MSQ), Old Bolingbroke (OB), Rauceby Warren (RAW), Risby Warren (RIW), Saltfleetby-Theddlethorpe Dunes (ST), Tattershall Sand Pits (TSP), Whisby Nature Park (WNP) and Woodall Spa (WS). The year of some of the records of M.W. Graham are not known so are given as 1941, the year in which these records were published. The records of C.F. George are given as pre-1889 and have been entered as 1888. The Red Data Book (Shirt, 1987) and National Notable or Scarce (Lists Na and Nb) (Falk, 1991) statuses with Archer National Statuses (ANS) (Archer, 2002, 2007) are given, as appropriate, for each species. The Archer National Statuses updates the statuses of Shirt (1987) and Falk (1991) besides giving a status to each of the common and widespread species. The Very Rare ANS is equivalent to Red Data Book status, the Rare ANS to Na status and the Scarce ANS to Nb status. The ANS Universal, Widespread and Restricted statuses refer to the common and widespread species. Small size refers to species about 3-6mm in length, medium-size species about 6-10mm in length and large species over 10mm in length.

Of the 18 species on the Lincolnshire list, 6 species have a Universal status, 8 species a Widespread status, one species a Restricted status (*Nomada sheppardana*, but not recorded since 1942), two species a Scarce status (*Nomada flavopicta* (not recorded since 1950) and *N. fulvicornis*), and one species (*Xylocopa violacea*) is a vagrant.

Subfamily Anthophorinae

Long-tongued solitary bees. Nationally 45 species (including 4 species restricted to the Channel Islands) in 7 genera.

Genus Nomada Scopoli, 1763.

Small to medium-size bees. Body sparsely hairy and cuticle marked with combination of yellow, red and black bands or spots. Cleptoparasitic usually on species of *Andrena*. The female enters the open cell of its host and inserts its egg into the wall of the cell. The first instar larva kills the egg or young larva of the host with its large sickle-shaped mandibles. Afterwards, the provisions are eaten. Pupae not enclosed within a cocoon. There may be one generation (e.g. *N. rufipes*) or two (e.g. *N. fabriciana*) generations a year. Sometimes the second generation has a very much reduced population (e.g. *N. goodeniana* and *N. marshamella*). Some spring species, usually with one generation a year, may persist into August (e.g. *N. lathburiana*, *N. panzeri*, *N. ruficornis* and *N. striata*); perhaps these later populations represent a partial second generation. Nationally 32 species (including 4 species restricted to the Channel Islands) with 14 species in Lincolnshire.

Nomada fabriciana (Linnaeus). Edwards & Broad, 2006. ANS Widespread.11 records. 21 April-15 August. Croxby Pond, 1993, JPF; MSQ, 2000, 2001, MEA; OB, 1941, MWG; RIW, 1984, 1985, MEA; ST, 1995, MEA; Tetney Blow Wells, 2009, ALP; WNP, 2009, ALP.

Nomada flava Panzer. ANS Widespread. 11 records. 21 April-19 June. Dixon Wood, 2007, ALP; Far Ings NR, 2005, ALP; KM, 1994, MEA; MSQ, 2000, MEA; RAW, 2001, 2003, MEA; Welton-le-Wolds, 2000, MEA; Westwoodside NP, 2006, SRS; WNP, 2006, 2008, PP, 2009, ALP.

Nomada flavoguttata (Kirby). ANS Universal. 1 record. OB, 1941, MWG.

Nomada flavopicta (Kirby). Nb. ANS Scarce. 2 records. 9 July. GR, 1950, HB; OB, 1941, MWG.

Nomada fulvicornis Fabricius. RDB3, RDB3, ANS Scarce. 4 records. April-20 July. Near Horncastle, 1946, MWG; KM, 1997, MEA; KL, 1888, CFG; RAW, 2001, MEA.

Nomada goodeniana (Kirby). ANS Universal. 53 records. 13 April-26 June. Blankney Fen, 1996, ASL; Blankney Village, 1990, 1992, ASL; Broughton Far Wood, 2009, ALP; Caistor Moor, 2008, ALP; Carr Plantation, 1982, SJH; Cleethorpes, 1998, JPF; Dixon Wood, 1998, JPF, 2007, ALP; Donna Nook, 1983, MEA, 2008, 2009, ALP; GP, 1994, MEA; GR, 1943, HB; Grasby, 1987, BB; Grimsby5, 1992, 1993, 1995, 1997, JPF; Guys Head, 1994, ASL; Irby Dales, 2009, ALP; KL, 1888, 1906, CFG; Linwood Warren, 1900, EAP; Low Hameringham, 2009, AD; MSQ, 1989, 1999, 2000, 2001, MEA; OB, 1941, MWG; Owlet Plantation, 2008, ALP; RAW, 1997, MEA; ST, 1992, 1995, 1996, MEA; Scotton Common, 2008, ALP; STP, 1995, AG; Tetney Blow Wells, 2008, ALP; Tetney Marsh, 1998, JPF; Welton-le-Wold, 2000, MEA; Westwoodside NP, 2006, SRS; WNP, 2007, JR, 2009, ALP.

Nomada lathburiana (Kirby). Edwards & Telfer 2002, RDB3, RDB3, ANS Widespread, 8 records, 10 May-1 June. Irby Dales, 2008, 2009, ALP; Laughton Forest, 2009, ALP; Linwood Warren, 2008, ALP; Owlet Plantation, 2008, ALP; RAW, 2001, MEA; STP, 1995, AG; WNP, 2009, PP.

Nomada leucophthalma (Kirby). Edwards & Telfer 2001, ANS Universal. 15 records. 21 April-14 June. Dixon Wood, 1998, JPF; near Horncastle, 1946, MWG; KM, 1992, MEA; Laughton Forest, 2009, ALP; Linwood Warren, 2008, ALP; MSQ, 1989, 1995, 2000, 2001, MEA; Owlet Plantation, 2008, ALP; WNP, 2006, GM, 2009, PP, ALP; Willingham Woods, 2008, ALP.

Nomada marshamella (Kirby). ANS Universal. 63 records. 12 April-2 July. Blankney Fen, 1990, 1998, ASL; Carr Plantation, 1982, SJH; Conisolme, 1992, JPF; Croxby Ponds, 1993, JPF; Dixon Wood, 1998, 1999, 2001, JPF; Donna Nook, 1983, MEA, 2008, ALP; Far Ings, 2005, JPF; GP, 1992, 1994, MEA, 1994, RWJU; Grebby, 1990, 1992, WGH; Grimsby5, 1992, JPF; Irby

Upon Humber, 2007, ALP; KM, 1990, MEA; Little Scrubbs Meadow, 2008, ALP; Low Hameringham, 2008, AD; MT, 1989, 1990, MEA; Mavis Enderby, 1994, AG; MSG, 1989, 1994, 1999, 2000, 2001, MEA; OB, 1941, MWG; RAW, 1992, 1993, 1994, 1995, 1997, 2001, 2002, MEA; RIW, 1984, 1985, 1989, MEA; ST, 1985, 1995, MEA; Tattershall, 1994, AG; STP, 1994, AG; Tetney Blow Wells, 2009, ALP; Tetney Marsh, 1998, JPF; WNP, 1994, PP, 2009, ALP.

Nomada panzeri Lepeletier. ANS Universal. 21 records. 29 April-13 June. Broughton Far Wood, 2009, ALP; Wybers Wood, 2008, ALP; Irby Dales, 2009, ALP; KM, 1992, MEA; Kirby-on-Bain, 2004, ASL; KL, 1888, CFG; Laughton Forest, 2009, ALP; Linwood Warren, 2008, ALP; MT, 1989, 1990, MEA; MSQ, 2000, 2001, MEA; OB, 1941, MWG; Tetney Blow Wells, 2008, ALP; WNP, 2009, PP, ALP; Wybers Wood, 2007, ALP.

Nomada ruficornis (Linnaeus). ANS Universal. 26 records. 4 May-25 June. Blankney Fen, 1993, ASL; Broughton Far Wood, 2009, ALP; Croxby Ponds, 1993, JPF; GP, 1994, RWJU; Grebby, 1988, WGH; Grimsby6, 1982, SJH; Irby Dales, 2009, ALP; KM, 1990, MEA; Little Scrubbs Meadow, 2008, ALP; MSQ, 1994, 1999, 2000, MEA; OB, 1941, MWG; RAW, 1992, 2001, MEA; RIW, 1985, MEA; ST, 1984, 1985, MEA, 2005, JPF; TSP, 1995, AG; Tetney Marsh, 2001, JPF; Vernatt's LNR, 2004, JB; WNP, 2009, ALP.

Nomada rufipes Fabricius. Edwards & Broad, 2006. ANS Widespread.11 records. 14 May-20 August. KM, 1989, 1991, 1994, MEA; OB, 1941, MWG; RIW, 1984, 1985, 1986, MEA; WS, 1989, MEA.

Nomada sheppardana (Kirby). ANS Restricted. 1 record. 20 June. GR, 1942, HB.

Nomada striata Fabricius. ANS Widespread. 4 records. 24 June. MSQ, 1988, MEA; OB, 1941, MWG; Raithby, 1941, MWG; Sausthorpe, 1941, MWG.

Genus *Anthophora* Latreille, 1803

Large bees. Black cuticle except the front of the male head which is yellow-marked. *A. plumipes* is usually a subterranean nester, but it also nests in old crumbling masonry. Nests usually of two or more burrows which end in short lengths of consecutively-arranged cells. Adults emerge from the pupae in the late summer but remain in their cells until the following spring. *A. furcata* nests in dead wood. Nests usually consist of two or more parallel galleries. Cells formed from enlarging a part of a gallery. Overwinter as prepupae in cocoons. One generation per year. Nationally 5 species with two species in Lincolnshire.

Anthophora furcata (Panzer). Edwards & Broad, 2006. ANS Widespread. 10 records. 28 May-9 August. GP, 1990, DSH; West Marsh, Grimsby, 2008, 2009, ALP; Grimsby4, 2007, ALP; Hameringham, 1936, HPJ; OB, 1941, MWG; RIW, 1984, 1985, MEA.

Anthophora plumipes (Pallas). Edwards & Broad, 2006. ANS Widespread. 19 records. 1 April-25 May. Dunstan, 2000, ASL; Fulbeck, 2009, APC; GP, 1994, MEA; Grebby, 1988, WGH; West Marsh, Grimsby, 2008, 2009, ALP; Irby Dales, 2009, ALP; Keelby, 2002, MT; KL, 1888, CFG; Lincoln, Burton Rd., 2001, RG; Low Hameringham, 2008, 2009, AD; OB, 1941, MWG; RAW, 1992, MEA; Snipe Dales, 1992, ASL; Tetney Blow Wells, 2008, ALP.

Genus Melecta Latreille, 1802
Large cleptoparasitic bees on species of *Anthophora*. Black cuticle, often with distinct lateral patches of white hairs on some gastral terga. Female digs into the nest of its host and makes a small hole through the cell wall through which an egg is laid on the inside of the wall of the cell. The hole in the cell is repaired with mud and the burrow entrance is re-plugged with soil. The first instar larva, with its long sickle-shaped mandibles, destroys the host's egg and other *Melecta* eggs or young larvae. Then the provisions are eaten. Pupation occurs within a cocoon. *M. albifrons* overwinter as adults within the cells of their hosts. One generation a year. Nationally 2 species, 1 species probably extinct and one species in Lincolnshire.

Melecta albifrons (Forster). Edwards & Broad, 2006. ANS Widespread. 3 records. 4-15 May. Donington, 2006, AF; KL, 1906, CFG; RAW, 1992, MEA.

Genus *Xylocopa* Latreille, 1809.
One vagrant species, *X. violaceus* (Linnaeus, 1758) recorded nationally and in Lincolnshire. A large black solitary bee (20-28mm) with short black which is dark grey on the thorax of the male. The wing are dark coloured with bluish reflections. The female burrows into dead wood, the burrow usually branching into parallel galleries running with the grain of the wood. The barrel-shaped unlined cells in short series are placed in the galleries. One record. Bassingham, 6 July 2002, GC.

Appendix – The grid references and natural areas of sites. The actual location of some sites by some recorders (17, 25, 40, 42, 46) are unknown, so the grid references for these sites can only be approximate.

1. Bassington SK9160 Trent Valley & Rises
2. Blankney Fen TF1262 The Fens
3. Blankney Village TF0860 The Fens
4. Broughton Far Wood SE9610 North Lincs. Coversands & Clay Vale
5. Carr Plantation TA2806 Lincs. Coast & Marshes
6. Caistor Moor. TA0801 North Lincs. Coversands & Clay Vale
7. Cleethorpes TA3207 Lincs. Coast & Marshes
8. Conisolme TF3945 Lincs. Coast & Marshes
9. Croxby Ponds TF1999 Lincs. Wolds
10. Dixon Wood TA2406 Lincs. Coast & Marshes
11. Donnington TF2036 The Fens
12. Donna Nook. TF4299. Lincs. Coast & Marshes
13. Dunstan TF0663 Lincs. & Rutland Limestone
14. Far Ings NR TA0223 Lincs. Coast & Marshes

15. Fulbeck SK9450 Trent Valley & Rises
16. Gibraltar Point. TF5557. Lincs. Coast & Marshes
17. Grantham. SK9136. Trent Valley & Rises
18. Grasby TA0804 Lincs. Wolds
19. Grebby TF4368 Lincs. Wolds
20. Grimsby4 TA2510 Urban
21. Grimsby5 TA2708 Urban
22. Grimsby6 TA2000 Urban
23. Guys Head TF4925 The Fens
24. Hameringham. TF3167. Lincs. Wolds
25. Horncastle, near TF26 North Lincs. Coversands & Clay Vale
26. Irby Dales. TA1905. Lincs. Coast and Marshes
27. Irby upon Humber. TA1905. Lincs. Coast & Marshes
28. Keelby TA1609 Lincs. Wolds
29. Kirby-on-Bain TF2462 North Lincs. Coversands & Clay Vale
30. Kirkby Moor. TF2262. North Lincs. Coversands & Clay Vale
31. Kirton-in-Lindsey SK9398 North Lincs. Coversands & Clay Vale
32. Laughton Forest SK8799 North Lincs. Coversands & Clay Vale
33. Lincoln, Burton Road SK9772 Urban
34. Linwood Warren TF1387 North Lincs. Coversands & Clay Vale
35. Little Scrubbs Meadow TF1474 North Lincs. Coversands & Clay Vale
36. Low Hameringham TF3066 Lincs. Wolds
37. Manton & Twigmoor. SE9305. North Lincs. Coversands & Clay Vale
38. Mavis Enderby SSSI. TF3667. Lincs. Wolds
39. Messingham Sand Quarry. SE9103. North Lincs. Coversands & Clay Vale
40. Old Bolingbroke. TF3564. North Lincs. Coversands & Clay Vale
41. Owlet Plantation NR. SK8395. North Lincs. Coversands & Clay Vale
42. Raithby. TF3767. Lincs. Wolds
43. Rauceby Warren. TF0343. Lincs. & Rutland Limestone
44. Risby Warren. SE9313. North Lincs. Coversands & Clay Vale
45. Saltfleetby-Theddlethorpe Dunes. TF4791. Lincs. Coast & Marshes
46. Sausthorpe TF3869 Lincs. Wolds
47. Scotton Common SSSI SK8698 North Lincs. Coversands & Clay Vale
48. Snipe Dales NR TF3368 Lincs. Wolds
49. Tattershall TF2158 North Lincs. Coversands & Clay Vale
50. Tattershall Sand Pits TF1959 North Lincs. Coversands & Clay Vale
51. Tetney Blow Wells SSSI TA3200 Lincs. Coast & Marshes
52. Tetney Marsh TA3304 Lincs. Coast & Marshes
53. Vernatt's LNR TF2424 The Fens
54. Welton-le-Wold TF2787 Lincs. Wolds
55. West Marsh, Grimsby TA2509 Urban
56. Westwoodside Nature Park SK7496 Humberhead Levels
57. Whisby Nature Park SK9167 Trent Valley & Rises
58. Willingham Woods TF1388 North Lincs. Coversands & Clay Vale
59. Woodall Spa TF1963 North Lincs. Coversands & Clay Vale
60. Wybers Wood TA2306 Lincs. Coast & Marshes

References

ANDREWES, Sir C. 1969. *The Lives of Wasps and Bees*. Chatto & Windus, London.
ARCHER, M.E. 2002. *The Wasps, Ants and Bees of Watsonian Yorkshire.* Yorkshire Naturalists' Union, York.
ARCHER, M.E. 2007. Archer's status values for the Solitary Wasps and Bees. *BWARS Newsletter.* Autumn 2007: 29-38.
EDWARDS, R. & TELFER, M.G. eds 2001. *Provisional atlas of the aculeate Hymenoptera of Britain and Ireland. Part 3.* Huntingdon Biological Records Centre.
EDWARDS, R. & TELFER, M.G. eds 2002. *Provisional atlas of the aculeate Hymenoptera of Britain and Ireland. Part 4.* Huntingdon Biological Records Centre.
EDWARDS, R. & BROAD, G.R. eds 2006. *Provisional atlas of the aculeate Hymenoptera of Britain and Ireland. Part 6.* Huntingdon Biological Records Centre.
FALK, S., 1991. A review of the scarce and threatened bees, wasps and ants of Great Britain. *Research and Survey in Nature Conservation* 35: 1-344.
GRAHAM, M.W. 1941. The Hymenoptera, Hemiptera, Neuroptera, Trichoptera, etc. in east Lincolnshire. *Entomologists' Monthly Magazine* 77: 97-101.
MICHENER, C.D. 2007. *The Bees of the World.* John Hopkins University Press, Baltimore.
NIXON, G. 1954. *The world of bees.* Hutchinson, London.
O'TOOLE, C. 7 RAW, 1991. A. *Bees of the World.* Blanford, London.
SHIRT, D.B. (ed.), 1987. British Red Data Books: 2. Insects. *Nature Conservancy council, Peterborough.*
WEAVER, G. 1997. Natural Areas & Lincolnshire. *The Lincolnshire Naturalist* 24: 95-110.
WEISS, K. 2002. *The Little Book of Bees.* Copernicus Books, New York.

A CHECKLIST OF THE NON-MARINE MOLLUSCA OF LINCOLNSHIRE, PART 1: THE FRESHWATER AND BRACKISH-WATER SPECIES

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Conchology (Non-Marine) Section Officer 1973-2010

Introduction

Various molluscan Checklists have been produced for Lincolnshire, or in the early days of conchology only for parts of the county, since the late 17th century. Dr Martin Lister (1638-1712) of Burwell, regarded as the founder of modern conchology, published his *Methodical Synopsis of Shells* (1685). This was the first book on land and freshwater molluscs and listed 20 species from the Burwell and Louth area. In the late 19th century T.D.A. Cockerell wrote *The Mollusca of Louth, Lincolnshire* (1885), Thomas Ball produced his *List of Land and Freshwater Shells* (1894) which only covered the Brigg district and this was followed by W.D. Roebuck who gathered together *Materials towards a List of Land and Freshwater Mollusca of Lincolnshire* (1887). In 1905, C.S. Carter, the LNU conchologist, provided his *Non-Marine Mollusca of Lincolnshire* and this was followed by W.D. Roebuck's *Census of Lincolnshire Land and Freshwater Mollusca* (1908). In 1931 C.S. Carter produced *Lincolnshire Pisidia* and J.F. Musham wrote *A Supplementary Checklist.*

The Checklist now produced is based on the work of the above 19th and 20th century authors and their contributing collectors, together with additional records published in Transactions of the Lincolnshire Naturalists' Union (Trans. LNU) and The Lincolnshire Naturalist. Further records have been assembled throughout the county by the writer since 1969 and from other contributors to LNU records and to the 1976 and 1999 National Atlas projects of the Conchological Society of Great Britain and Ireland (CSGBI). Additional information regarding first Vice County records was received from Dr M.P. Kerney during his tenure as CSGBI National Recorder for non-marine molluscs.

In the following checklists I have followed the species sequence used in *Atlas of the Land and Freshwater Molluscs of Britain and Ireland* (1999). Nomenclature follows the latest revision published by R. Anderson in 2005. Each species' scientific name is followed by its authority and year of publication. Where a different nomenclature was used by Carter or Roebuck, or elsewhere in LNU publications, this has been included to aid future comparison with the earlier articles. Vernacular names are taken from Kerney (1999) except for *Pseudanodonta complanata* formerly known as compressed river mussel and now known as depressed river mussel and *Sphaerium solidum* known as Witham orb mussel. However conchologists invariably use scientific names for all species.

Status accounts: First known records with location, date and recorder (where known) are given for Vice Counties 53 (South Lincolnshire) and 54 (North Lincolnshire). These are followed by a general description of distribution and current status. This is followed by the number of 10km squares that the species has been recorded from during the period 1965 to 2009, out of a total of the county's 90 10km squares, in the form (20/90). For 10km square maps showing distribution the reader is referred to Kerney (1999). Records of sub-fossil material from Holocene deposits, principally from the Broughton area, are not included in these accounts.

Theodoxus fluviatilis (L.,1758), River nerite
Neritina fluviatilis
VC 53: (R.Witham?), Bracebridge, old shells, Dec 1884, C.T. Musson.
VC 54: R. Witham, Lincoln, 1849 J. Hardy.
Locally distributed in rivers Witham, Welland and Glen, (10/90). Found on large stones, rocks, bricks and masonry.

Viviparus viviparus (L., 1758), Common river snail
VC 53: R. Witham, Lincoln, 1849, J. Hardy.
VC 54: R. Trent, Gainsborough, 12.2.1890, G. Roberts.
Locally distributed in rivers Trent, Ancholme, Witham, Steeping, Louth Canal and Welland, (23/90). Found on muddy bottoms.

Viviparus contectus (Millet,1813), Lister's river snail
Viviparus fasciatus
VC 53: (R. Witham?), Bracebridge, Dec 1884, C.T. Musson.
VC 54: (R. Ancholme?), Brigg area, 1864, T. Ball.
In R. Steeping and lower Witham. Replaces *V. viviparous* in fenland rivers and large drains, (20/90). Possibly extinct in Lincoln Witham and Fossdike. Found on muddy bottoms.

Valvata cristata (Millet, 1813), Flat valve snail
VC 53: Near Lincoln, 25.4.1894, F.W. Fierke.
VC 54: Brigg area 1864, T. Ball.
Widely distributed except on Wolds, (52/90). Occurs in well vegetated slow-flowing or still waters.

Valvata macrostoma Morch,1864, Large-mouthed valve snail
VC 53: Cowbit Wash, 27.8.1925, A. South.
VC 54: No verified records. All claims have proved to be juvenile *V. piscinalis*.
A rare fenland species formerly restricted to Cowbit and Crowland washes, Baston Fen and Pinchbeck Slipe nature reserves and Pinchbeck North Fen Slipe, (3/90). Last recorded from Baston Fen in 1985 and believed to be extinct in the county. Occurred almost exclusively in peaty water bodies.

Valvata piscinalis (Muller, 1774) Common valve snail
VC 53: Near Boston, 8.9.1884, W.D. Roebuck.
VC 54: Brigg area, 1864, T. Ball.
Common and widespread throughout the county,(70/90). Occurs in lakes, rivers and drains, but possibly declining. Prefers muddy or silty substrates.

Ventrosia ventrosa (Montagu, 1803) a spire snail
Hydrobia ventrosa, Paludestrina ventrosa.
Early records may include the less common *Hydrobia acuta.*
VC 53: Kirton Shore, 21.8.1924, A. Smith.
VC 54: North Somercotes, 1889, H.W. Kew.
Locally distributed in coastal waters of low salinity typical of brackish lagoons and ditches. Restricted to the Wash and Humber estuaries, (10/90).

Hydrobia acuta neglecta (Muss, 1963) A spire snail
Hydrobia neglecta
VC 53: Wyberton Marsh, 1973, M.J. Bishop.
VC 54: Killinghome Haven, 1986, Nature Conservancy Council report.

A very local species of brackish coastal lagoons with high salinity. Only records are from three 10km squares in the Wash and from one in the Humber estuary, (4/90).

Peringia ulvae (Pennant, 1777) Laver spire snail
Hydrobia ulvae, Sabanaea ulvae, Paludestrina stagnalis
VC 53: Kirton Shore, 21.8.1924, A. Smith.
VC 54: Saltfleetby, 1889, H.W. Kew
An abundant species of saltmarshes and uppermarsh mudflats. Found throughout the coast except were sand predominates, (16/90).

Mercuria c.f. similis (Draparnaud, 1805) Swollen spire snail
Pseudamnicola confusa, Mercuria confusa
VC 53: No verified records.
VC 54: Saltfleetby, 1907, F. Rhodes . This still is the northernmost record for Britain. Several claims for this rare and nationally declining estuary and tidal ditch species have proved to be *Assiminea grayana* or *Bithynia tentaculata* specimens that have occurred as flood-wrack material washed down into tidal reaches. No records since 1913. (1/90).

Potamopyrgus antipodarum (Gray, 1840) Jenkin's spire snail
Potamopyrgus jenkinsi
VC 53: Kirton Shore, 21.8.1924, A. Smith
VC 54: Tetney Haven, 17.4.1902, C.S. Carter & H.W. Kew
First noted in England about 1850 it was originally a brackish water species. It is now more common in freshwaters and occurs throughout the county, (87/90). Tolerant of mild pollution.

Bithynia tentaculata (L., 1758) Common bithynia
VC 53: Boston, 8.9.1884, W.D. Roebuck
VC 54: Louth area? 1678, M. Lister; Brigg area, 1864, T. Ball.
A species of muddy bottoms in rivers, canals and fenland drains. Common throughout the county, (83/90).

Bithynia leachii (Sheppard, 1823) Leach's bithynia
VC 53: Boston, 8.9.1884, W.D. Roebuck
VC 54: Brigg area, 1864, T. Ball
Usually associated with the previous species, but tends to be less widespread, (50/90).

Assiminea grayana Fleming, 1828 Dun sentinel
VC53 : Saracen's Head, Whaplode, 16.7.1970, E.J. Redshaw.
VC54: New Holland, 28.10.1950, A. Smith.
Local in saltmarshes and brackish pools. Also occurs sparingly in brackish ditches some distance from the coast. Restricted to The Wash and Humber estuary areas, (10/90).

Myosotella myosotis (Draparnaud, 1801) Mouse-eared snail
Ovatella myosotis, Phytia myosotis

VC53: Kirton Shore, 21.8.1924, A. Smith.
VC54: Tetney Haven, 17.4.1902, C.S. Carter & H.W. Kew
Found in estuaries, especially in large numbers among tide-wrack. Common in The Wash and Humber areas, (15/90).

Myosotella denticulata (Montagu, 1803). A mouse-eared snail
May occur with the above species. However no known verified records for Lincolnshire as species determined only since the publication of the 1999 Atlas, (0/90).

Aplexa hypnorum (L., 1758) Moss bladder snail
VC53: near Lincoln,24 May1894, F.W. Fierke.
VC54: Brigg area, 1864, T. Ball.
More common in the fenland area than elsewhere in the county, (32/90). A species of weedy pools and ditches; common in some years and scarce in others. Can survive periodic drying out of its habitat.

Physa fontinalis (L., 1758) Common bladder snail
VC53: Bracebridge, Dec 1884, C.T. Musson.
VC54: Louth area? 1678, M. Lister; Brigg area, 1864, T. Ball.
Widespread throughout the county, (71/90). Common in clean running water and an indicator of unpolluted conditions.

Physella sp. non- *P.fontinalis* bladder snails.
Possibly *P. acuta* (Draparnaud, 1805) or *P. heterostropha*
Undetermined non-*fontinalis Physa* species have been recorded from about ten sites in VC 54 and two in VC53.
VC53*: P. acuta*, R. Witham, Lincoln, 1971, P. Kalinowski.
VC54: *P. heterostropha*,
Found in rivers and drains, often where polluted conditions will not support *P. fontinalis.* Also occurs in brackish drains and ditches, (11/90). Possibly more widely distributed than records indicate.

Galba truncatula (Muller, 1774) Dwarf pond snail
Lymnaea truncatula
VC53: Ancaster, 17.4.1886, W.D. Roebuck.
VC54: Brigg area, 1864, T. Ball.
Widely distributed in marshy grassland, dune slacks and on bare mud. Often occurs out of water. Appears to be absent from large areas in the middle of the county where it would be thought to occur, (57/90).

Omphiscola glabra (Muller, 1774) Mud pond snail
Lymnaea glabra
VC53: South of Lincoln, 1886, Rev. W.W. Fowler.
VC54: North of Scunthorpe, 25.8.1910, Dr. W. Wallace.
A species of nutrient-poor ponds.
The 1886 site 'south of Lincoln' was in a pool 'next to the railway line'. Trans. LNU 1905 records that this pool was destroyed before 1890. Subsequently found in a pool on sandy soil in Skellingthorpe Big Wood, 20.4.1996 by Mrs V.

Wilkin and J. Bratton. This is currently the only known site for this species in the county, (1/90). The site 'north of Scunthorpe' was shallow and filled with vegetation and situated on the blown sand commons. The species was last recorded at this site in 1913.

Lymnaea palustris agg. (Muller, 1774) Marsh pond snail
This is an aggregate species comprising *L. palustris* and *L. fusca* (C..Pfeifferi)
VC53: Crowland, July 1886, T.W. Bell.
VC54: Brigg area, 1864, T. Ball.
A widespread but localised species of stagnant or slow-moving water bodies. Appears to be more common in the south of the county, (34/90). All records up to 1999 have been identified and mapped as *L. palustris.* Although it is believed that the majority of county records will refer to *L. fusca* none have so far been determined by dissection.

Lymnaea stagnalis (L., 1758) Great pond snail
VC53: Crowland Wash, July 1886, T.W. Bell.
VC54: Louth area? 1678, M. Lister; Brigg area, 1864, T. Ball.
Found in permanent water bodies from rivers to drainage ditches. Also introduced into ornamental garden ponds. Appears to be absent from parts of the Wolds and from parts of the Wash hinterland in South Holland, (51/90).

Radix auricularia (L., 1758) Ear pond snail
Lymnaea auricularia
VC53: R. Witham, Bracebridge, 1884, C.T. Musson.
VC54: Brigg area, 1864, T. Ball.
Habitats and distribution similar to previous species, though less common, (41/90).

Radix balthica (L., 1758) Wandering (or common) pond snail
Lymnaea peregra, L. ovata
VC53: Near Boston, 8.9.1884, W.D. Roebuck.
VC54, Near Brigg, 1864, T. Ball.
One of the most common and widely distributed aquatic molluscs, present in almost all 10km squares in the county, 89/90).

Mxyas glutinosa (Muller, 1774) Glutinous snail
Lymnaea glutinosa
VC53: No records.
VC54: Mar Dyke, Saltfleetby All Saints, 1894, H.W.Kew.
Subsequent (and only records) 'in abundance in a drain near Tetney', April 1902, C.S. Carter & H.W. Kew; an immature specimen from the Mar Dyke near Saltfleetby Station, 22.8.1905. The last record for the county was from Brigg, c.1910, J. Kidson-Taylor. (0/90). This species is now absent from all bar one of its forty previous locations in England.

Planorbis planorbis (L., 1758) Margined ram's-horn snail
Planorbis umbilicatus
VC53: Boston, 8.9.1884, W.D. Roebuck.

VC54: Louth Canal, 15.4.1886, W.D. Roebuck.
Common in all well-vegetated aquatic habits. Widely distributed, (77/90).

Planorbis carinatus Muller, 1774. Keeled ram's-horn snail
VC53: Shells in flood debris, Bracebridge, Dec, 1884, C.T. Musson.
VC54: Brigg, 1864, T. Ball.
Found in similar habitats to previous species, common but less widely distributed, (42/90).

Anisus leucostoma (Millet, 1813) Button (or white-lipped) ram's-horn
Planorbis leucostoma, P. spirorbis
VC53: Boston, 8.9.1884, W.D. Roebuck.
VC54: Brigg, 1864, T. Ball.
Found in most aquatic habits including closed ponds, often in those that lose surface water in summer. Widely distributed, (49/90).

Anisus vortex (L. 1758) Whirlpool ram's-horn
Planorbis vortex
VC53: Shells in flood debris, Bracebridge, Dec. 1884, C.T. Musson.
VC54: Brigg, 1864, T. Ball.
Found in well oxygenated, vegetation rich, permanent water bodies. Unlike previous species seldom found in closed ponds. Widely distributed and more common than previous species, (80/90).

Bathyomphalus contortus (L., 1758) Twisted ram's-horn
Planorbis contortus
VC53: Shells in flood refuse, Bracebridge, Dec. 1884, C.T. Musson.
VC54: Brigg, 1864, T. Ball.
Found in most permanent water bodies, including ditches and small enclosed ponds. Common and widely distributed, (61/90).

Gyraulus laevis (Alder, 1838) Smooth ram's-horn
Planorbis laevis
VC53: R. Witham, Langrick Bridge, 17.3.1974, CSGBI field meeting
VC54: None
Records from VC53 in 1921 and 1951 CSGBI censuses believed to be errors (M.P. Kerney, pers. comm. 11.11.1977). Found in VC53 in only five 10km squares up to the 1999 census, (6/90). The species is usually found in quiet weedy ponds and lakes, but in Lincolnshire has also been found in R. Witham and fen drains.

Gyraulus albus (Muller, 1774) White ram's-horn
Planorbis albus
VC53: Shells in flood debris, R. Witham, Bracebridge, Dec. 1884, C.T. Musson.
VC54: Brigg, 1864, T. Ball.
A common species found in most types of permanent aquatic habit, (61/90).

Gyraulus crista (L. 1758) Nautilus ram's-horn
Armiger crista, Planorbis crista
VC53: Near Boston, 8.9.1884, W.D. Roebuck.
VC54: Brigg, 1864, T. Ball.
Found in similar habits to the previous species, but less common and locally distributed, (26/90).

Hippeutis complanatus (L. 1758) Flat ram's-horn
Segmentina complanata
VC53: Shells in flood debris, R. Witham, Bracebridge, Dec. 1884, C.T. Musson.
VC54: Brigg, 1864, T. Ball.
Found in well-vegetated locations in a variety of water bodies. Locally distributed, (19/90).

Segmentina nitida (Muller, 1774) Shiny ram's-horn
VC53: Pinchbeck, 20.9.1897, W.D. Roebuck.
VC54: Grainthorpe, 16.3.1887, Miss Longley.
Recorded in the county from only eight 10km squares pre-1930. Last record was from Steeping River, Wainfleet, 1928, F.W. Harness. (0/90). Formerly found in well-vegetated marsh drains. Elsewhere this species has declined throughout much of England south of a line from Bridlington to Morecambe.

Planorbarius corneus (L. 1758) Great ram's-horn
Planorbis corneus
VC53: Shells in flood debris, R. Witham, Bracebridge, Dec. 1884, C.T. Musson.
VC54: Louth area, 1678, M. Lister. Brigg area, 1864, T. Ball.
Widely distributed in rivers, lakes, and large drainage ditches. Also found, and introduced into ornamental garden ponds, (38/90).

Ancylus fluviatilis Muller, 1774. River limpet
VC53: R. Witham, Grantham, June 1902, R. Worsdale.
VC54: Hubbard's Valley stream, Louth, April 1886, H.W. Kew.
Found in rivers and streams attached to stones and bricks. Although essentially a species of quick-flowing waters, such as the upper Witham and Glen, it also occurs in the lowland Witham and its tributary streams, (24/90).

Ferrissia wautieri (Mirolli, 1960) a freshwater limpet
VC53: None.
VC54: R .Lymm, Crow's Bridge, Thorpe Culvert, 7 November 2005, A. Constable (EA).
This species is found in well-vegetated, slow-flowing or stagnant waters. The above is the only record for the county, (1/90).

Acroloxus lacustris (L.,1758) Lake limpet
Ancylus lacustris
VC53: Fossdyke, Lincoln, 24.5.1894, F.W. Fierke.
VC54: Pond at Ailby near Alford, 14.4.1886, W.D. Roebuck.

Found in clean canals, lowland rivers, lakes, drains and ponds. Has a widely scattered distribution throughout the county, (27/90).

Unio pictorum (L., 1758) Painter's mussel
VC53: R. Witham, Bracebridge, Dec. 1884, C.T. Musson.
VC54: Brigg, 1864, T. Ball.
The most common widespread mussel of lowland rivers, lakes, canals, and drains, (34/90).

Unio tumidus Philipsson, 1788, Swollen river mussel
VC53: Grantham canal, 16.8.1902, R. Worsdale.
VC54: R. Witham, Lincoln, April 1840, J.R. Hardy.
Found in lowland rivers and canals. Far less common than the previous species, (17/90), most records being from the rivers Ancholme, Witham and Welland.

Anodonta cygnea (L., 1758) Swan mussel
VC53: R. Witham, Bracebridge, Dec. 1888, C.T. Musson.
Vc54: Brigg, 1864, T. Ball.
Our largest mussel. A common and widespread species of muddy/silty substrates in lowland rivers, canals, lakes and drains, (28/90). Some of the largest specimens have been found in mature flooded gravel pits.

Anodonta anatina (L., 1758) Duck mussel
VC53: Boultham, 17.9.1905, J.F. Musham.
VC54: Fossdyke, Lincoln, June 1879, J. Whitwham.
Also found in lowland rivers and canals, but absent from lakes and gravel pits. Sometimes found in running waters on sandy substrates. Widespread and marginally more common than the previous species, (42/90).

Pseudanodonta complanata (Rossmassler, 1835) Depressed river mussel
Anodonta minima
VC53: R. Witham, Tattershall Bridge, 17.3.1974, CSGBI field meeting
VC54: R. Witham, Fiskerton, March 2002, I. Killeen.
A county rarity. All records are from the lowland R. Witham, (3/90).

Sphaerium corneum (L., 1758) Horny orb mussel
VC53: Flood debris, R. Witham, Bracebridge, Dec. 1884, C.T. Musson.
VC54: Brigg area, 1864, T. Ball.
This, the most common of the orb mussels, is found in a wide range of habitats from main rivers to ponds and ditches. It has been found in almost all 10 km squares except for a few around the south end of The Wash, (72/90).

Sphaerium rivicola (Lamark, 1818) River orb mussel
VC53: Flood debris, R. Witham, Bracebridge, Dec. 1884, C.T. Musson.
VC54: Brigg area, 1864, T. Ball.
This mussel is restricted to deeper water than the previous species and is found in rivers, canals and some larger fen drains. Far more local in its

distribution than the previous species, (14/90), it is mainly found in the Witham, Fossdyke, Trent and Ancholme systems.

Sphaerium solidum (Normand, 1844) Witham orb mussel
VC53: R. Witham, Langrick Bridge, 6.7.1968, E.B. Rands.
VC54: None
A nationally rare species found in Lincolnshire only along about 15km of the R. Witham and in Timberland Delph, (3/90). Elsewhere the species has more recently been found in the R. Great Ouse, near Earith. Not known in British Isles until specimen taken in Timberland Delph, 30.5.1973, E.J. Redshaw. Subsequently the 1968 specimen found in collection at Leeds Museum. Other records from Tattershall Bridge, 6.11.1973, B. Colville, and Timberland Delph, 21.7.1990, (CSGBI field meeting). The species is at risk from pollution and the population is possibly declining as none found in Timberland Delph in 2002.

Musculium lacustre (Muller, 1774) Lake (or capped) orb mussel
Sphaerium lacustre
VC53: R. Witham, Waddington, 6.7.1907, J.F. Musham.
VC54: Brigg area, 1864, T. Ball.
Found along the margins of most aquatic habitats, especially in weedy ponds and ditches, usually attached to plants. Common and widely distributed, (55/90).

Pisidia, the pea mussels
Vernacular names for these small mussels were proposed in Janus (1965). However, with the exception of *Pisidium amnicum*, there are no vernacular names in general use

Pisidium amnicum (Muller, 1774) River (or giant) pea mussel
VC53: R. Witham south bank, Bardney, 1902, H.W. Kew.
VC54: Louth Canal, 1913, B.B. Woodward.
Occurs in clean waters in rivers, streams, canals and drainage ditches. Common and widespread, (32/90).

Pisidium casertanum (Poli, 1791)
Pisidium cinereum, P. fontinale, P.steenbuckii
VC53: Waddington, 7.7.1907, J.F. Musham.
VC54: South Kelsey, 1902, E.A. Woodruffe-Peacock.
Found in all kinds of aquatic habitats and can survive seasonal desiccation. Another common and widespread mussel, (40/90).

Pisidium personatum Malm,1855
VC53: Pond at Tortoiseshell Wood, 6 June1972, E.J. Redshaw.
VC54: Ruckland, 1902, B.B. Woodward.
A species of grassy ponds and ditches; able to withstand seasonal desiccation. Has a very localised distribution, (23/90).

Pisidium obtusale (Lamark, 1818)
VC53: Gedney, 9.5.1910, J.F. Musham & W.D. Roebuck.
VC54: The Moat, Linwood, 1901, B.B. Woodward.
Occurs in grassy ponds and ditches, but requires permanent water bodies. Has a very localised distribution and found mainly in the south of the county, (15/90).

Pisidium milium Held, 1835
VC53: R. Witham, North Hykeham, 11 April 1908, J.F. Musham.
VC54: Revesby Reservoir, 1901, B.B. Woodward.
Found in a wide variety of habits, but avoiding swampy locations and those liable to dry up. This species does not appear to be common and has a very localised distribution, (20/90).

Pisidium pseudosphaerium Schlesch, 1947
VC53: Metheringham Delph, Tanvats, 21.7.1990, B. Coles (CSGBI field meeting).
VC54: None.
Nationally a very localised species with only one record from Lincolnshire, (1/90). At Tanvats the species was found in clear water, among aquatic vegetation, over an organic substrate.

Pisidium subtruncatum Malm1855
VC53: Ruskington, 26.9.1907, J.F. Musham.
VC54: Pond at Tathwell, 1902, B.B. Woodward.
Found in rivers, canals, lakes, ponds and drainage systems. A common and widespread species that appears to be absent from the north-east and from the silt lands south of The Wash. (56/90).

Pisidium supinum A.Schidt, 1851
VC53: Grantham canal, 1902, H. Preston.
VC54: None known
Restricted to large lowland rivers and canals. Extremely localised in the county, (6/90). All records from the lowland R. Witham appear to be from the west bank (VC53).

Pisidium henslowanum (Sheppard, 1823)
VC53: R. Witham, Bracebridge, 27.8.1918, C. Oldham.
VC54: R. Ancholme near Appleby, 1902, H.W. Kew.
Although the species is said to prefer running waters and is found in the upland section of the R. Glen, there are localised populations in the lowland section of the R. Witham and West Fen Catchwater Drain, (13/90). No recent records from former squares along the Ancholme system.

Pisidium hibernicum Westerlund, 1894
VC53: R. Witham, North Hykeham, 11.4.1908, J.F. Musham.
VC54: Fiskerton, 20.7.1907, J.F. Musham.

A rare pea mussel in Lincolnshire, found in a variety of clean rivers and canals, this is a species more characteristic of lakes in the highland zone. (3/90).

Pisidium nitidum Jenyns, 1832
VC53: R. Witham, Bracebridge, 1918, C. Oldham.
VC54: The Moat, Linwood, 1901, B.B. Woodward.
Found in rivers, canals, streams, ponds and ditches. Common and widespread, (50/90).

Pisidium pulchellum Jenyns, 1832
VC53: Ditch at Torksey, 24.8.1918, C. Oldham.
VC54: Tetney, 1902, B.B. Woodward.
The species occurs in slow stream, marsh drains and ponds. Appears to be extremely rare in Lincolnshire and not refound in its former locations. One recent record from the Isle of Axholme and one from the Lincoln area, (2/90).

Pisidium moitessierianum Paladilhe,1866
VC53: R. Witham, Belton, 1970, M.P. Kerney.
VC54: Steeping River, Crow's Bridge near Wainfleet, 24.4.1973, E.J. Redshaw. Another rare species in Lincolnshire restricted to good freshwater habitats in rivers and canals, (5/90).

Dreissena polymorpha (Pallas, 1771) Zebra mussel
VC53: Fossdyke, Lincoln, 24.5.1894, F.W. Fierke.
VC54: Brigg area, 1864, T. Ball.
Restricted to clean rivers, canals and reservoirs. Found only in the major river systems in the county where it can be fairly common, (20/90).

Mytilopsis leucophaeata (Conrad, 1831) Dark false mussel
VC53: South Forty Foot Drain, Swineshead Bridge, 15.11.2006, M. Gammell (EA)
VC54: Maud Foster Drain, Rawson's Bridge, 15.11.2006, M. Gammell (EA).
The latest addition to the county's freshwater mollusca, (3/90). All freshwater drain locations indicate slightly brackish conditions. Only other record for this species is from South Holland Main Drain, Sutton St. James, 30.11.2006, C. Extence (EA). There were only two previous British records, one from Wales and one from Kent.

References

ANDERSON, R. 2005. An annotated list of the non-marine Mollusca of Britain and Ireland, *Journal of Conchology* 38, pp 607-637)
BALL, T. 1894 List of Land and Freshwater Shells, *The Naturalist*
CARTER, C.S. 1905. Non-Marine Mollusca of Lincolnshire *Trans. LNU. Vol 1, pp 29-52.*
CARTER, C.S., 1931 Lincolnshire Pisidia *Trans. LNU,* Vol 8, pp 37 – 39.
COCKERELL, T.D.A. 1885. The Mollusca of Louth, Lincolnshire, *The Naturalist's World*

JANUS, H. 1965. *The Young Specialist looks at Molluscs*, Burke
KERNEY, M.P. 1999 *Atlas of the Land and Freshwater Molluscs of Britain and Ireland* Harley Books
LISTER, M., 1685. *Methodical Synopsis of Shells.* Proceedings of the Royal Society
MUSHAM, J.F., 1931. A Supplementary Checklist *Trans. LNU, Vol 8, pp 39 – 48.*
ROEBUCK, W.D. 1887. Materials towards a List of Land and Freshwater Mollusca of Lincolnshire, *The Naturalist*
ROEBUCK, W.D., 1908. Census of Lincolnshire Land and Freshwater Mollusca *Trans. LNU, Vol 1, pp 307 – 311.*

THE ANTS (HYMENOPTERA: FORMICIDAE) OF LINCOLNSHIRE

Alan L. Phillips

Introduction

This paper deals with the species of ants recorded in the two vice-counties (53 & 54) of Watsonian Lincolnshire. In the past the ants have received little attention in the county with most literature references relating to the national distribution of the wood ant *Formica rufa* (Donisthorpe, 1927; Nelmes, 1938; Yarrow, 1955; Barrett, 1968). The earliest mention of ants found was from 1850, and again was in relation to *F. rufa*, with an account of nests near Skellingthorpe (Matthews, 1884). Graham (1941) listed 11 species he recorded in the county and Collingwood (1961) listed 6 new vice-county records. Collingwood and Barrett (1964) gave a national distribution of all British species of which 18 were listed as being present in Lincolnshire.

At present the ant fauna of the UK is in somewhat of a flux, with several species due to be added to the list of native species in the not too distant future. At present there are approximately 49 native species recognised from mainland Britain. Added to this figure are 5 species restricted to the Channel Islands, plus 10 introduced or 'tramp' species. Being from warmer climates, these tramp species are usually restricted to heated buildings such as large glasshouses or hospitals. The species restricted to the Channel Islands and the introduced tramp species are not discussed here further. Out of the 49 native species 19 have been recorded in Lincolnshire. For a general guide and introduction to ants, Skinner and Allen (1996) and Pontin (2005) should be consulted.

Species accounts

In what follows, the species are listed by subfamily, genus and species, with the name of the author given after genus and species names. The species are not listed in any particular order but the familiar species are listed first followed by relatedness. Nomenclature follows that of Seifert (2007). The species information given is based on that included in the Provisional Atlases of the Bees, Wasps and Ants Recording Society (BWARS). The full series of Provisional Atlases are not yet complete, but the relevant one for the species concerned is indicated (PA). Further information is taken from Barrett (1979), Pontin (2005), and the online species distribution maps (linked to the NBN Gateway) on the BWARS website (www.bwars.com). These maps should be consulted in future for those seeking species distribution information. Due to shortage of recording effort within Lincolnshire it would be unwise to give county statuses for each species, but the number of records for each species recorded can be used as a general guide. It should be noted that even with low record numbers it is obvious that some commoner species (e.g. *Lasius niger* s.s., *Myrmica ruginodis*) are as widespread in the county as they are nationally.

Records

This paper is based on 190 records of 19 species which have been recorded from 65 sites by 24 recorders. Records are listed alphabetically by site location and give year date of record followed by recorders name. The exact dates of the records of M.W. Graham are not known so the publishing date of the paper (Graham, 1941) where he listed them is used as the record date. Where appropriate, extra information is given in relation to individual records for some rarer species. Grid references for site locations are included in the appendix along with Natural Areas (Weaver, 1997).

Family Formicidae – all ants
Subfamily Formicinae
Ants belonging to this subfamily have one segment to the waist and the abdomen possesses a terminal orifice where formic acid is secreted in some genera. The body is relatively smooth but can be shining or matt in appearance. Pupae are usually enclosed in cocoons. Nationally 2 genera with 2 found in Lincolnshire.

Genus *Lasius* Fabricius, 1804
Members of this genus can vary in colour from jet-black to brown to yellowish. Dark species forage above ground and yellow species are subterranean in habit. Length of workers typically ranges 3.5-6.5m. Males are similar size to workers, queens are larger. Nationally 11 species with 6 recorded in Lincolnshire.

Lasius niger sensu stricto (Linnaeus, 1758).
The ubiquitous black garden ant commonly encountered in most lowland habitats and often found entering houses. Seifert (1991) found that *Lasius niger* consisted of two species, the true *L. niger* sensu strico (Linnaeus, 1758) and *L. platythorax* Seifert, 1991. Because of this separation, previous records of *L. niger*, unless supported by re-examined specimens, should technically be referred to as *L. niger* sensu lato. Although *L. platythorax* has not been

recorded in Lincolnshire it has been recorded in the neighbouring counties of Norfolk and Yorkshire so it is probably present in the county. *L. niger* s.s. prefers dry, sun-exposed sites where it often nests under stones or wood, whereas *L. platythorax* has been found to occur in damp, more shady habitats where it usually nests in damp wood or rotten stumps. Only records of *L. niger* sensu stricto are listed here. 27 county records.

Banovallum House, 2007, D. Sheppard, 2008, C. Smith, 2009, A.L. Phillips, 2009, D. Sheppard & R.S. Key; Broughton, 2007, M. Lush; Broughton Far Wood, 2009, A.L. Phillips; Cleethorpes Country Park, 2009, A.L. Phillips; Dunston Washway, 2007, M.G. Fox; Gibraltar Point, 1994, D.S. Hill; 2009, A.L. Phillips; Irby Dales, 2009, A.L. Phillips; Laughton Forest, 2009, A.L. Phillips; Low Hameringham, 2009, A. Dale; Pyewipe, Grimsby, 2009, A.L. Phillips; Rauceby Warren, 2009, P.J. Attewell; Risby Warren, 1986, M.E. Archer; Saltfleetby-Theddlethorpe Dunes, 2009, A.L. Phillips; Spalding, 2009, A. Faulkner; Stallingborough, 2009, A.L. Phillips; Vernatt's LNR, 2004, J. Bills; West Marsh, Grimsby, 2009, A.L. Phillips; Whisby Nature Park, 2009, A.L. Phillips; Wybers Wood, Grimsby, 2009, A.L. Phillips.

Lasius psammophilus Seifert, 1992.
Seifert (1992) discovered that *Lasius alienus* consisted of two species, the true *L. alienus* sensu stricto Foerster 1850, and *L. psammophilus* Seifert, 1992. As with *L. niger* above any records prior to this split will have to be recorded as *L. alienus* sensu lato unless specimens are available for re-examination (this currently applies to one record of *L. alienus* s.l.: Risby Warren, 1989, W.A. Ely). *L. psammophilus* prefers sandy heaths and coastal dunes, whereas *L. alienus s.s* is found on warm sites with short vegetation such as chalk grasslands. Nationally both species have a southerly, widespread, if somewhat local distribution. In Collingwood (1961) *L. alienus* was listed as being recorded at Gibraltar Point. This has subsequently been updated to *L. psammophilus* (Collingwood, pers. comm.). 1 county record.

Gibraltar Point, 1958, C.A. Collingwood.

Lasius flavus (Fabricius, 1782)
Commonly called the yellow meadow ant. This is a subterranean species rarely seen above ground, it occurs in old grassland and pasture on a variety of soil types where it builds up nesting mounds of earth which in time become covered in vegetation. The size and number (at some sites in the hundreds) of these mounds gives a good indication of the age of the unimproved grassland. It is also commonly found under objects such as stones in roadside verges or gardens, so some care is needed with identification to rule out the other much rarer yellow *Lasius* species (in Lincolnshire, *L. mixtus* and *L. umbratus*). A nationally widespread and locally abundant species. 26 county records.

Atkinson's Warren, 1995, R.S. Key; Beckingham Ranges, 1996, R.S. Key; Belton House Estate, 2005, R. Allen; Castle Bytham, 1996, R.S. Key; Dunston Washway, 2007, M.G. Fox; Gibraltar Point, 1994, D.S. Hill; Scartho, Grimsby, 1996, M.G. Fox; Low Hameringham, 2009, A. Dale; Normanby-le-Wold, 2009, A.L. Phillips; Old Bolingbroke, 1941, M.W. Graham; Rauceby Warren, 2009, P.J. Attewell; Risby Warren, 1986, M.E. Archer, 1989, R.S. Key, 1989, W.A. Ely; Saltfleetby-Theddlethorpe Dunes, 2009, A.L. Phillips; Twigmoor, 1989, W.A. Ely , 1993, R.S. Key; Vernatt's LNR, 1994, 1998, A. Faulkner; Whisby Nature Park, 2009, A.L. Phillips; Woolsthorpe and Wyville Old Railway, 1994, R.S. Key; Woolsthorpe Disused Railway, 1999, C. O'Toole.

Lasius mixtus (Nylander, 1846).
Yellow ants of the subgenus Chthonolasius. A subterranean nester among roots, under logs or large stones, usually in open habitats such as grasslands, field margins etc. Due to its subterranean nature, this species is mostly encountered as alate or dealate brown-coloured queens after mating flights. It is a temporary social parasite that cannot found its own colonies. Nests are initiated when a new queen takes over the nest of another species of *Lasius*, where it usurps the resident queen and is adopted by the host workers. These workers are eventually replaced by the invading queen's progeny. Nationally with a widespread distribution, with scattered records north to Scotland. It is never common but probably very under-recorded due to its subterranean habit. 3 county records.

Hagnaby Lock, 1941, M.W. Graham; Old Bolingbroke, 1941, M.W. Graham; Willingham Woods, 2009, A.L. Phillips.

Lasius umbratus (Nylander, 1846)
Another yellow Chthonolasius species, the comments on nest initiation of *L. mixtus* above also similarly apply. This species appears to be more shade-tolerant than *L. mixtus*, with nests also occurring in wooded areas and hedgerows where it often nests in deadwood. Nationally with a widespread distribution, with scattered records north to Scotland. It is never common but probably very under-recorded due to its subterranean habit. 4 county records.

Ancaster, 1956, C.A. Collingwood; Low Hameringham, 2007, A. Dale; Orby, 1958, G.H.L. Dicker; Uffington, 1956, C.A. Collingwood.

Lasius fuliginosus (Latrielle, 1798). PA: Edwards, 1997.
A shiny jet-black ant with a heart-shaped head. It is often found forming trails of workers which are characterized as having slow, deliberate movements. This species is a temporary social parasite which founds its colonies by taking over the nests of *Lasius mixtus* or *L. umbratus*. It is found in hedgerows, road banks or wood edges where it builds carton nests of macerated wood. It has an arboreal nature so is sometimes recorded by beating trees or bushes. Due to its method of colony reproduction it is a good indicator of the presence of its host species even though they may not have been recorded in the vicinity. Nationally with a widespread, mostly southern, distribution. A post-1961 record included in Barrett (1979) in grid square TF09 is omitted at this time because apart from the probable site name (Holton-le-Moor) further details of the record are unknown. 5 county records.

Hagnaby Lock, 1941, M.W. Graham; Old Bolingbroke, 1941, M.W. Graham; Rauceby Copse, 1996, A.P. Fowles; Rauceby Warren, 2009, P.J. Attewell; Welton-le-Wold, 1957, C.A. Collingwood.

Genus *Formica* Linnaeus, 1758
Blackish or dark-brown to bicoloured red and black ants, of medium to large size. Worker length typically 5-7mm, but up to 10mm in *Formica rufa*. Males are of similar size to queens. Nationally 11 species with 4 found in Lincolnshire.

Formica rufa Linnaeus, 1761. PA: Edwards, 1997.
The ‘southern wood ant’ is a large species with red and black body markings. They build distinctive nest mounds constructed of pine needles and leaf litter which in some cases can be over a metre in width. Populations are usually found in open pine or oak woodland and woodland edges. Nationally with a southern, widespread distribution. Locally common in range. The closely related *Formica lugubris* replaces it further north or at higher altitudes. A record listed in Nelmes (1938) is included here but should be treated with caution as the exact site location and identity of the recorder is unclear at this time*. Similarly, the record dating from 1850 in Matthews (1884) should also be treated with some caution as it is impossible to fully substantiate such an old record**. In Attewell (2008) Laughton Forest was listed as a new site in Lincolnshire for the species. The author has subsequently discovered this population was introduced prior to 1993 (Andy Powers (Forestry Comission), pers. comm.). 9 county records.

Coningsby, 1941, M.W. Graham; *Doddington Wood, 1938, E. Nelmes; Fulsby Wood, 1996, D. Bryce; Laughton Forest, 2008, M. Hodsman, 2009, A.L. Phillips; **Skellingthorpe, 1850, H.S.R. Matthews; Troy Wood, 1955, C.A. Collingwood; Tumby, 1941, M.W. Graham; Woodhall Spa, 1941, M.W. Graham.

Formica fusca Linnaeus, 1758. PA: Edwards & Broad, 2005.
Quite large black-brown ants which are quite active when disturbed. An adaptable species found along woodland edges and clearings, heaths, grassland edges and disturbed ground. Nests can be found under various types of ground debris including stones, wood, old roots and even old tyres. *F. fusca* is very similar to *F. lemani* but nationally has a more southerly distribution than the later. In Lincolnshire there is a distribution overlap so both species may be encountered on the same site. Nationally with a southerly, widespread distribution. Locally common in range. 20 county records.

Castle Bytham, 1996, R.S. Key; Colsterworth, 1999, C. O'Toole; Gibraltar Point, 2009, A.L. Phillips; Laughton Forest, 2009, A.L. Phillips; Linwood Warren, 2008, C. Smith, 2008, A.L. Phillips; Owlet Plantation, 2008, C. Smith, 2008, A.L. Phillips; Rauceby Warren, 1996, D. Bryce, 2009, P.J. Attewell; Saltfleetby-Theddlethorpe Dunes, 2009, A.L. Phillips; Whisby Nature Park, 2009, A.L. Phillips; Willingham Woods, 1975, W.A. Ely, 2009, A.L. Phillips;

Woodhall Spa, 1941, M.W. Graham; Woolsthorpe Disused Railway, 1999, C. O'Toole.

Formica lemani Bondroit, 1917. PA: Edwards & Broad, 2005.
Description and habitat similar to *F. fusca* above, but nationally has a more northerly, widespread distribution. Locally common in range. 15 county records.

Irby Dales, 2008, A.L. Phillips; Laughton Forest, 2009, A.L. Phillips; Normanby, 2008, C. Smith; Pyewipe, Grimsby, 2009, A.L. Phillips; Risby Warren, 1989, W.A. Ely, 2008, C. Smith; Scotton Common, 2008, A.L. Phillips.

Formica cunicularia Latreille, 1798. PA: Edwards & Broad, 2005.
This ant looks very similar to *Formica fusca* and *F. lemani* but it usually has reddish colouring on the cheeks, sides of thorax and legs. Darker specimens do occur so care is needed with identification. A warmth-loving species often abundant along coastal banks and grassy slopes or occurring inland among sandy heaths and along railway embankments. Nests are located in sunny situations in grass or under stones. Bare earth mounds are often constructed to gather extra warmth from the sun. Nationally with a southern, restricted distribution, with southern Lincolnshire close to its northern limit. 1 county record.

Wilsford, 1957, C.A. Collingwood.

Subfamily Myrmicinae
Ants belonging to this subfamily have two segments to the waist and posses a sting. The gasters are relatively smooth in appearance but other parts of the body can be coarsely sculptured or wrinkled. Pupae are naked and males are of a similar size to queens. Nationally 11 genera with 4 found in Lincolnshire.

Genus *Myrmica* Latreille, 1804
Members of this genus are typically called 'red ants' but colour can vary from dark red-brown to orange and to almost yellow in young individuals. Length of workers typically ranges 3.5-6mm. Nationally 12 species, with 6 recorded in Lincolnshire.

Myrmica rubra (Linnaeus, 1758)
Occurs in a wide range of open habitats such as grassland, gardens and open woodland, especially in damper areas, where it nests under stones, wood or similar debris. A nationally widespread and locally common species. 15 county records.

Dixon Wood, 2009, A.L. Phillips; Gibraltar Point, 1976, 1986, W.A. Ely, 1994, D.S. Hill, 2009, A.L. Phillips; Humberston Blow Wells, 2009, A.L. Phillips; Humberston Fitties, 2009, A.L. Phillips; Normanby-le-Wold, 2009, A.L. Phillips; Osgodby Moor, 2009, C. Smith; Rauceby Warren, 2009, P.J. Attewell; Scartho, Grimsby, 1996, M.G. Fox; Stallingborough, 2009, A.L. Phillips.

Myrmica ruginodis Nylander, 1846
A species which occurs in similar habitats to *M. rubra* but it is more shade-tolerant, so is abundant in wooded areas where it often nests under lying deadwood. A nationally widespread and locally common species. 24 county records.

Belton Park, 1984, K.N.A. Alexander & D.K. Clements; Broughton Far Wood, 2009, A.L. Phillips; Donna Nook, 2008, C. Smith; Frampton Marsh, 1996, D. Bryce; Gibraltar Point, 1976, W.A. Ely; Goslings Corner, 2008, C. Smith; Laughton Forest, 2009, A.L. Phillips; Legsby Wood, 2008, C. Smith; Old Bolingroke, 1941, M.W. Graham; Owlet Plantation, 2008, C. Smith; Rauceby Warren, 2009, P.J. Attewell; Risby Warren, 1989, W.A. Ely; Saltfleetby-Theddlethorpe Dunes, 2009, A.L. Phillips; Scotton Common, 1988, P. Kirby & S. Lambert; Twigmoor, 1989, W.A. Ely; Tydd St. Mary, 1992, R.S. Key; Usselby Plantation, 2008, C. Smith; Vernatt's LNR, 1998, A. Faulkner; Walesby Road Plantation, 2008, C. Smith; Willingham Woods, 2009, A.L. Phillips; Woodhall Spa, 1941, M.W. Graham.

Myrmica scabrinodis Nylander, 1846
Found in a wide range of habitats from meadow to woodland, from to coastal dunes to heaths and often in damp areas. It will nest under stones, wood or in tussocks of grass. A nationally widespread and locally common species. 18 county records.

Donna Nook, 2008, C. Smith; Gibraltar Point, 1976, 1986, W.A. Ely, 2009, A.L. Phillips; Irby Dales, 2009, A.L. Phillips; Laughton Forest, 2009, A.L. Phillips; Normanby-le-Wold, 2009, A.L. Phillips; North Somercotes, 2008, C. Smith; Owlet Plantation, 2008, C. Smith; Rauceby Warren, 2009, P.J. Attewell; Saltfleetby-Theddlethorpe Dunes, 2009, A.L. Phillips; Skendleby Hall, 1997, W.A. Ely; Twigmoor, 1989, W.A. Ely; Whisby Nature Park, 2009, A.L. Phillips.

Myrmica sabuleti Meinert, 1861
A species preferring dry, warm situations such as sandy heaths, chalk downs and dry quarries, where it usually nests under stones in short vegetation. In these habitats it often replaces *M. scabrinodis*. This species is associated with the large blue butterfly *Maculinea arion* (Thomas et al., 2009). Nationally widespread with a local distribution. 8 county records.

Donna Nook, 2009, A.L. Phillips; Gibraltar Point, 2009, A.L. Phillips; Hagnaby Lock, 1941, M.W. Graham; Irby Dales, 2009, A.L. Phillips; Laughton Forest, 2009, A.L. Phillips; Linwood Warren, 2008, C. Smith; Rauceby Warren, 2009, P.J. Attewell; Saltfleetby-Theddlethorpe Dunes, 2009, A.L. Phillips.

Myrmica lobicornis Nylander, 1846. PA: Edwards, 1998.
An often quite dark-coloured ant, it is an unobtrusive species with small nests in the ground or under stones and foragers are usually encountered as single, somewhat slow-moving (as compared to other *Myrmica*) individuals. It occurs

in open habitats such as upland moor, lowland heath or grassland but can tolerate some shade as in open woodland glades or edges. Nationally widespread but sparsely recorded. 4 county records.

Boston, 1956, C.A. Collingwood; Gibraltar Point, 1986, W.A. Ely; Old Bolingbroke, 1941, M.W. Graham; Scawby, 1941, M.W. Graham.

Myrmica schencki Viereck, 1903. PA: Edwards & Roy, 2009.
A subterranean warm-loving species found among sparse or short turf-like vegetation on dry sheltered sites including short grassland, dunes, heaths and banks, where it nests in soil or grass tussocks. Nationally scarce with records generally restricted to southern England and south Wales, but with sporadic records north to S. Lincolnshire. 2 county records.

Rauceby Warren, 2009, P.J. Attewell; Wilsford, 1957, C.A. Collingwood.

Genus *Leptothorax* (Mayr, 1855)
Reddish-brown ants which resemble small, slim *Myrmica*. Ends of the antenna are club-like. Length of workers typically 3.5-4mm. Nationally 1 species, with 1 recorded in Lincolnshire.

Leptothorax acervorum (Fabricius, 1793). PA: Edwards, 1998.
Typically found in woodland, hedgerow and heath where they nest in deadwood, tree stumps or sometimes under stones. Small nests with typically 20 or so workers though larger nests with more than one queen do occur. A nationally widespread species with records to the north of Scotland. Locally sporadic in abundance. 6 county records.

Gibraltar Point, 2009, A.L. Phillips; Laughton Forest, 2009, A.L. Phillips; Old Bolingbroke, 1941, M.W. Graham; Owlet Plantation, 2008, A.L. Phillips; Risby Warren, 1989, W.A. Ely; Scotton Common, 1988, P. Kirby & S. Lambert.

Genus *Formicoxenus* Mayr, 1855
These are small red-brown, yellow-brown to blackish ants. Length of workers typically ranges 2.8-3mm. Nationally 1 species, with 1 recorded in Lincolnshire.

Formicoxenus nitidulus (Nylander, 1846). PA: Edwards & Telfer, 2002.
This species lives as an inquiline in the nests of wood ants (in the UK *Formica rufa, F. lugubris, F. aquilonia*) where nests are built within wood, twigs or dead bracken stems. Nationally widespread but restricted to where its hosts are established. 1 county record.

Troy Wood, 1955, C.A. Collingwood.

Genus *Stenamma* Westwood, 1840
Small subterranean ants with a slim waist and reduced eyes. Length of workers typically ranges 3.5-4mm. Nationally 2 species, with 1 recorded in Lincolnshire.

Stenamma debile (Foerster, 1850)
Found in woodland and hedgerows where it can tolerate deep shade. It nests under stones, moss, or in hollow twigs. Colonies are usually small with one queen and a dozen workers. A secretive species which is usually found by sifting through leaf litter or moss etc. It is probably very under-recorded and care is needed when separating it from the rarer *S. westwoodii s.s.* Nationally with a southern distribution, with most records coming from south east England. Local in abundance. 1 county record.

Goslings Corner Wood, 2008, C. Smith.

Discussion

There are clearly not enough records to come up with firm conclusions about the distribution and status of many, if not most, of the ant species found in the county. Many of the records, particularly of some of the rarer species, date back to before 1960 so a concerted effort is needed to discover if some of these species are in fact still present. It is hoped that the records and information included in this paper act as a foundation for future recording of ants in Lincolnshire.

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Appendix – The grid references and Natural Areas of sites. The actual location of some of the sites by some recorders (1, 7, 13, 15, 22, 34, 46, 50, 53, 57, 61, 62) are unknown, so the grid references given can only be approximate. On large sites which may span several 1km grid squares (e.g. 20, 26, 59), and where individual records may come from several of these squares, only a centralised grid reference is given.

Ancaster. SK9843. Lincs. & Rutland Limestone.
Atkinson's Warren. SE8713. North Lincs. Coversands & Clay Vale.
Banovallum House. TF2569. North Lincs. Coversands & Clay Vale.
Beckingham Ranges. SK8754. Trent Valley & Rises.
Belton House Estate. SK9238. Lincs. & Rutland Limestone.
Belton Park. SK9338. Lincs. & Rutland Limestone.
Boston. TF3241. The Fens.
Broughton Far Wood. SE9610. North Lincs. Coversands & Clay Vale.
Broughton. SE9609. North Lincs. Coversands & Clay Vale.
Castle Bytham. SK9918. Lincs. & Rutland Limestone.

Cleethorpes Country Park. TA3006. Lincs. Coasts & Marshes.
Colsterworth. SK9223. Lincs. & Rutland Limestone.
Coningsby. TF2258. North Lincs. Coversands & Clay Vale.
Dixons Wood. TA2405. Lincs. Coasts & Marshes.
Doddington Wood. SK9069. Trent Valley & Rises.
Donna Nook. TF4299. Lincs. Coasts & Marshes.
Dunston Washway. TF1466. The Fens.
Frampton Marsh. TF3639. The Fens.
Fulsby Wood. TF2560. North Lincs. Coversands & Clay Vale.
Gibraltar Point. TF5558. Lincs. Coasts & Marshes.
Gosling Corner. TF1475. North Lincs. Coversands & Clay Vale.
Hagnaby Lock. TF3359. The Fens.
Humberston Blow Wells. TA3104. Lincs. Coasts & Marshes.
Humberston Fitties. TA3305. Lincs. Coasts & Marshes.
Irby Dales. TA1905. Lincs. Wolds.
Laughton Forest. SK8499. North Lincs. Coversands & Clay Vale.
Legsby Wood. TF1387. North Lincs. Coversands & Clay Vale.
Linwood Warren. TF1387. North Lincs. Coversands & Clay Vale.
Low Hameringham. TF3066. North Lincs. Coversands & Clay Vale.
Normanby-le-Wold. TF1294. Lincs. Wolds.
Normanby. SE8817. North Lincs. Coversands & Clay Vale.
North Somercotes. TF4197. Lincs. Coasts & Marshes.
Old Bolingbroke. TF3564. North Lincs. Coversands & Clay Vale.
Orby. TF4967. Lincs. Coasts & Marshes.
Osgodby Moor. TF0992. North Lincs. Coversands & Clay Vale.
Owlet Plantation. SK8295. North Lincs. Coversands & Clay Vale.
Pyewipe, Grimsby. TA2511. Humber Estuary/Industrial.
Rauceby Copse. TF0343. Lincs. & Rutland Limestone.
Rauceby Warren. TF0243. Lincs. & Rutland Limestone.
Risby Warren. SE9213. North Lincs. Coversands & Clay Vale.
Saltfleetby-Theddlethorpe Dunes. TF4691. Lincs. Coasts & Marshes.
Scartho, Grimsby. TA2705. Lincs. Coasts & Marshes/Urban.
Scawby. SE9605. North Lincs. Coversands & Clay Vale.
Scotton Common. SK8798. North Lincs. Coversands & Clay Vale.
Skellingthorpe. SK9072. Trent Valley & Rises.
Skendleby Hall. TF4369. Lincs. Wolds.
Spalding. TF2422. The Fens.
Stallingborough. TA2214. Humber Estuary/Industrial.
Troy Wood. TF2558. North Lincs. Coversands & Clay Vale.
Tumby. TF2559. North Lincs. Coversands & Clay Vale.
Twigmoor. SE9305. North Lincs. Coversands & Clay Vale.
Tydd St. Mary. TF4418. The Fens.
Uffington. TF0607. Lincs. & Rutland Limestone.
Usselby Plantation. TF1092. North Lincs. Coversands & Clay Vale.
Vernatt's LNR. TF2424. The Fens.
Walesby Road Plantation. TF1190. North Lincs. Coversands & Clay Vale.
Welton-le-Wold. TF2786. Lincs. Wolds.
West Marsh, Grimsby. TA2510. Humber Estuary/Urban.
Whisby Nature Park. SK9166. Trent Valley & Rises.

Willingham Woods. TF1388. North Lincs. Coversands & Clay Vale.
Wilsford. TF0043. Lincs. & Rutland Limestone.
Woodhall Spa. TF2063. North Lincs. Coversands & Clay Vale.
Woolsthorpe & Wyville Old Railway. SK9027. Lincs. & Rutland Limestone.
Woolsthorpe Disused Railway. SK9024. Lincs. & Rutland Limestone.
Wybers Wood, Grimsby. TA2309. Lincs. Coasts & Marshes/Urban.

References

ATTEWELL, P.J., 2008. Wood ants in Lincolnshire: a new site for *Formica rufa* Linnaeus, 1758. *BWARS Newsletter*, autumn 2008: 12-13.

BARRETT, K.E.J., 1968. A Survey of the Distribution and Present Status of the Wood Ant, *Formica rufa* L. (Hym., Formicidae) in England and Wales. *Trans. Soc. Brit. Ent.* 17: 217-233.

BARRETT, K.E.J., 1979. Provisional Atlas of the Insects of the British Isles. Part 5, Hymenoptera: Formicidae, Ants. Huntingdon Biological Records Centre.

COLLINGWOOD, C.A., 1961. New Vice-County Records for British Ants. *Ent. Rec.* 73: 90-93

COLLINGWOOD, C.A. & BARRETT, K.E.J., 1964. The identification and Distribution of British Ants. 2: The Vice-County Distribution of Indigenous Ants in the British Isles. *Trans. Soc. Brit. Ent.* 16: 114-121.

DONISTHORPE, H.St.J.K., 1927. *British Ants, their Life Histories & Classification.* G. Routledge & Sons Ltd, London.

EDWARDS, R. ed., 1997. *Provisional Atlas of the aculeate Hymenoptera of Britain and Ireland.* Part 1. Huntingdon: Biological Records Centre.

EDWARDS, R. ed., 1998. *Provisional Atlas of the aculeate Hymenoptera of Britain and Ireland.* Part 2. Huntingdon: Biological Records Centre.

EDWARDS, R. & TELFER, M.G. eds., 2002. *Provisional Atlas of the aculeate Hymenoptera of Britain and Ireland. Part 4.* Huntingdon: Biological Records Centre.

EDWARDS, R. & BROAD, G.R. eds., 2005. *Provisional Atlas of the aculeate Hymenoptera of Britain and Ireland. Part 5.* Huntingdon: Biological Records Centre.

EDWARDS, R. & ROY, H. eds., 2009. *Provisional Atlas of the aculeate Hymenoptera of Britain and Ireland. Part 7.* Wallingford: Biological Records Centre.

GRAHAM, M.W., 1941. Hymenoptera, Hemiptera, Neuroptera, Trichoptera, etc. in East Lincolnshire. *Ent. Mon. Mag.*77: 97-101.

MATTHEWS, A., 1884. A Memoir of Ant-life by the Late Rev. H.S.R. Matthews: The Wars of the Ants. *Ent. Mon. Mag.* 20: 209-210.

NELMES, E., 1938. A Survey of the Distribution of the Wood Ant (Formica rufa) in England, Wales and Scotland. *J. Anim. Ecol.* 7: 74-104. Brit. Ecol. Soc.

PONTIN, J., 2005. *Ants of Surrey.* Surrey Wildlife Trust.

SEIFERT, B., 1991. Lasius platythorax n.sp., a widespread sibling species of Lasius niger (Hymenoptera: Formicidae). *Entomol. Gener.* 16(1): 69-81.

SEIFERT, B., 1992. A taxonomic revision of Palaearctic members of the subgenus Lasius s.str. (Hymenoptera: Formicidae). *Abh. Ber. Naturkundemus. Gorlitz.* 66/5: 1-67.
SEIFERT, B., 2007. Die Ameisen Mittel- und Nordeuropas. Tauer: lutra.
SKINNER, G.J. & ALLEN, G.W., 1996. *Ants.* Naturalists' Handbook 24. Richmond Publishing.
Thomas, J.A., Simcox, D.J. & Clarke, R.T., 2009. Successful Conservation of a Threatened *Maculinea* Butterfly. *Science.* 325:5936:80-83.
WEAVER, G., 1997. Natural Areas & Lincolnshire. *The Lincolnshire Naturalist.* 24: 95-110.
YARROW, I.H.H., 1955. The British Ants allied to *Formica rufa* L. (Hym., Formicidae). *Trans. Soc. Brit. Ent.* 12: 1-48.

EARTHQUAKES IN LINCOLNSHIRE

John Aram

When most of the resident population of Lincolnshire was awoken just before 1.00am on the 27th February 2008 by a rumbling noise followed by several seconds when buildings and furniture were shaken, it was a real surprise. Possible explanations included a lorry crashing into the house; a railway train leaving the tracks; or a petro-chemical plant exploding, but few realised that it was actually an earthquake. Although Lincolnshire felt the outer ripples of the largest earthquake of last century, the 5.4ML Lleyn Peninsula 1984 event, there had not been a significant earthquake with its focus beneath the county since 1755.

The 2008 earthquake originated relatively deep beneath the northern part of the county and was felt throughout the East Midlands and as far away as Truro and Aberdeen. Initial studies showed that strain energy had been building beneath the county and finally the rocks fractured at a depth of about 18 kilometres below the surface. The energy released at the focus equated to that of a small atomic bomb, reaching the nearest point on the Earth's surface at the epicentre, about 4 kilometres north of Market Rasen. From here the decreasing energy radiated across the county and into adjacent regions, fetching down chimney pots as far away as Gainsborough and Doncaster. Minor damage to properties included slates and tiles being dislodged and 'hair-line cracks' appearing in plaster on walls and ceilings. More substantial damage included an old barn in the Fens collapsing, part of a limestone farmhouse wall falling away near North Rauceby, whilst the spire of St. Mary Magdalene church at Waltham-on-the-Wolds (Leicestershire) was so severely cracked that it had to be re-built. The following morning many of the county's residents discovered other minor evidence of the passage of earthquake waves; washing machines, fridges and other loose equipment had 'walked' out from beneath work-tops, mirrors and pictures were hanging at strange angles and heaps of books had fallen from shelves.

Scale of Felt Intensity (Mercalli) (Figure 1)

I	Instrumental: detected only by seismographs
II	Feeble: felt only by a few sensitive people at rest.
III	Slight: similar to the vibrations due to a lorry passing close by.
IV	Moderate: like the passing of a very heavy road vehicle; shaking and rocking of loose objects including stationary cars.
V	Fairly strong: felt by most people; many sleeping people awaken, church bells may ring.
VI	Strong: most people frightened; windows broken; dishes fall from cupboards and shelves.
VII	Very strong: general alarm; walls crack; plaster falls.

N.B. the scale goes up to XII Catastrophic: total destruction; ground visibly rises and falls; cracks open and close; heavy objects thrown through the air.

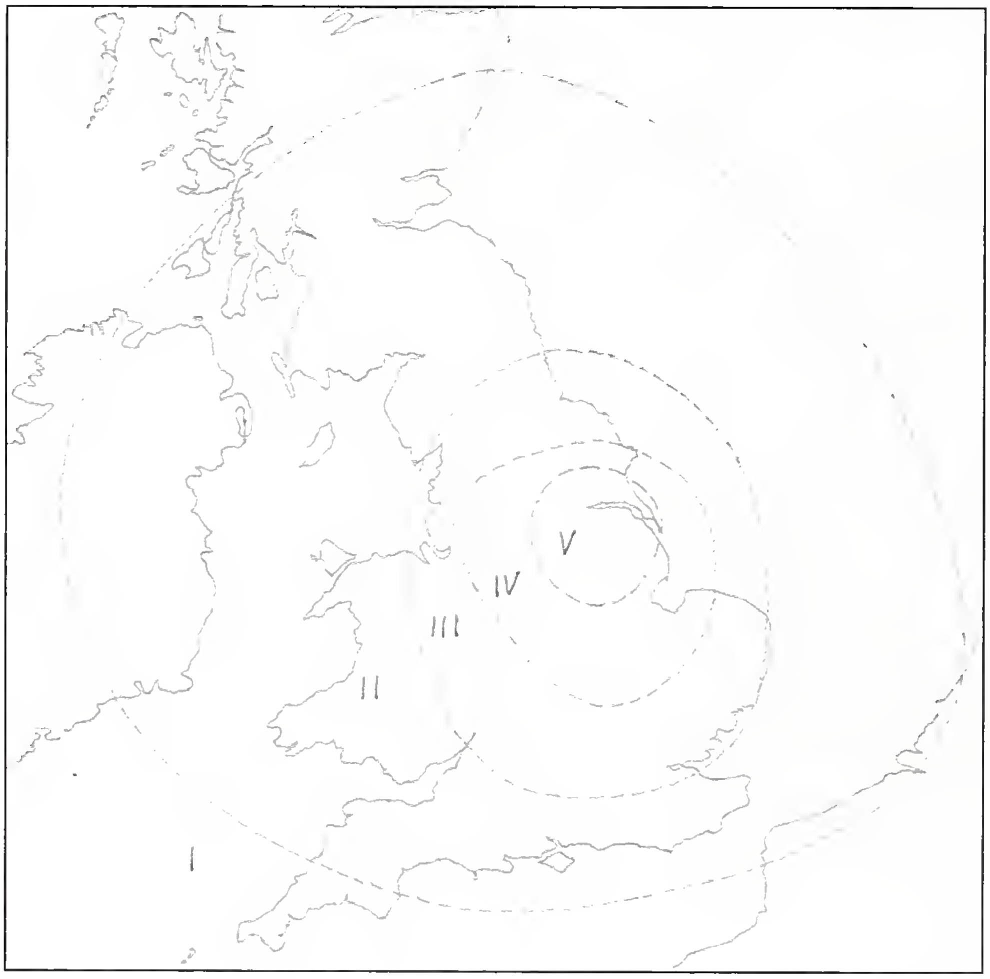


Figure 1.
Map of felt intensity

What is felt at the surface depends not only on the energy released at the focus, but its depth below surface and the distance to the observer. Different types of rocks between the focus and the Earth's surface transmit different types of shock-waves at slightly different rates, with varying losses of energy with distance. Because they have travelled a shorter distance to the surface shallow focus earthquakes have more energy when they reach the surface then deeper focus ones, so they usually cause more damage. The actual damage to buildings is closely related to their type, construction, age and condition; with modern buildings in known earthquake belts designed to withstand very severe shaking. Older and taller buildings and those less well built or maintained are more likely to suffer major damage or collapse. In Gainsborough the insurance assessors claimed that many of the chimney stacks were no longer in use with no evidence of any recent maintenance. Where a number of chimney pots and capping stones were damaged or fell in Fulbeck, the properties were nearly all more than a century old, built of the local limestone and constructed directly on the Marlstone Rock Bed, without concrete foundations (Figure 2).

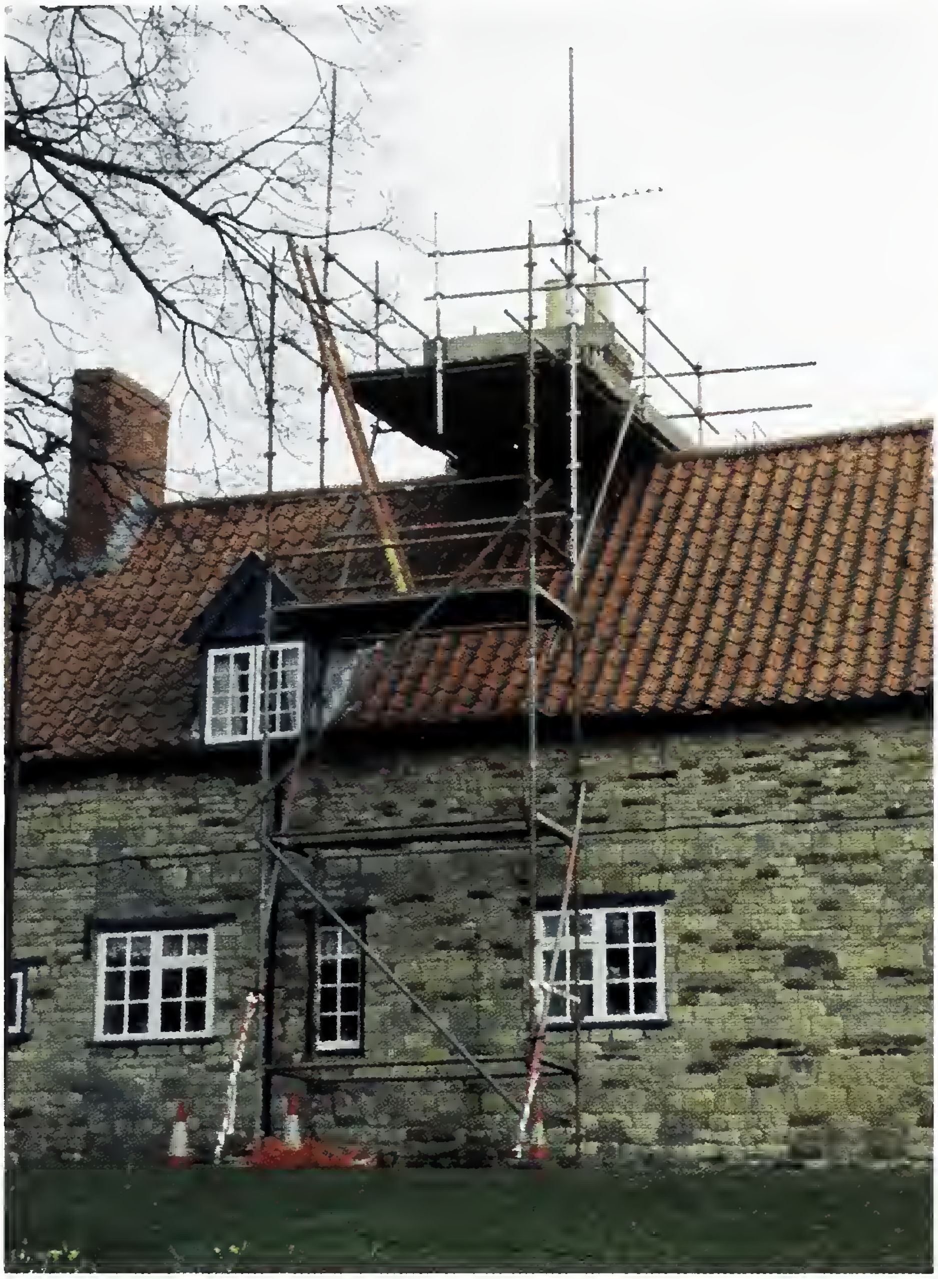


Figure 2. Repairs to a damaged chimney stack in Fulbeck
Photo J. Aram

By 3rd March 2008, the British Geological Survey had received over 18,000 on-line reports on the intensity of the earthquake that they used to construction a map of felt intensity (Figure 1). Generally this decreased with distance from the epicentre, variations being due to differing deeper rock types and structures. Analysis of the records from the 130 national seismic stations and from as far away as Canada and Alaska, allowed the focus of the Lincolnshire Earthquake to be precisely fixed at a depth of 18.6 Kilometres with a magnitude of 5.2ML The initial movement had occurred along a strike-slip fault-plane in rocks beneath the Carboniferous, with three after-shocks of 1.8ML at 02.46, 1.8ML at 09.03 and 2.2ML at 16.54 on 27th February. With their epicentres to the south of Market Rasen they also occurred along the west-south-west dipping fault plane of the ‘Brigg Fault’, previously known from deep seismic prospecting for on-shore oil.

This earthquake was not only significant locally but with a magnitude of 5.2ML the largest earthquake in Britain since the 5.4ML event in North Wales in 1984. The magnitude scale is a measure of energy released at the focus and not a linear scale, with each increase of a full digit on the scale equating to an energy release approximately 32 times greater. Earthquakes of magnitude greater than 5ML are relatively rare in Britain, only occurring 2 or 3 times in most people's life-time, with an average of one about every 30 years. Globally there are around 590 earthquakes of this magnitude every year but nearly all occur in the well-known earthquake belts that border the Earth's tectonic plates.

The long term record of Lincolnshire earthquakes goes back to 15th April 1185 when Lincoln Cathedral was severely damaged by what was probably one of the largest UK on-shore earthquakes of the last two millennia! Although the vicar of Driby recorded 'stones falling from chimneys' in North Lincolnshire in 1343 there are few recorded events then until the 23rd August 1750 when North Lincolnshire and adjoining counties felt an off-shore event, estimated at 4.7ML. A similar event of 5.1ML in the North Sea off the Lincolnshire coast on 9 February 1958 upset flowerpots in Lincoln and was felt by the Royal family at Sandringham. In 1755 William Stukeley had reported to the Royal Society concerning an earthquake that damaged walls in houses on the south bank of the Humber. The UK's largest measured earthquake (6.1ML) occurred on 7th June 1931, with its epicentre in the Dogger Bank area it was felt throughout the country. Whilst in Filey the top of a church spire was rotated, little damage was reported in Lincolnshire other than the widening of existing cracks in the flying buttresses on Lincoln Cathedral. Due to the regional tectonics in the North Sea area there will certainly be further substantial earthquakes that will impact on Lincolnshire; but maybe not in the reader's life-time.

AN OVER-LOOKED POPULATION OF *PULSATILLA VULGARIS* MILL. IN SOUTH LINCOLNSHIRE (V.C. 53)

Richard Jefferson and Kevin Walker

On 25th April 2009, a single flowering plant of *Pulsatilla vulgaris* was discovered at a new site by Richard Jefferson and Fiona Hart on a west-facing slope of Swinstead Valley Site of Special Scientific Interest (SSSI), near Swinstead, South Lincolnshire (v.c. 53, TF007222). The site was visited again on the 4th May, when a further patch was located close-by and on 6th May when a more detailed search by Richard Jefferson and Kevin Walker revealed a total of four 'plants'. Two had flowered but in both cases the infloresences had been removed by sheep or rabbits. The other two plants were small and had not flowered. All were located within a 20 × 5 m area on an exposed 'shoulder' of limestone grassland on the east side of a narrow valley. The plants were on a moderately steep (c.30°) west-facing slope (280-310°N) where the vegetation had been kept very short by rabbit and sheep grazing

(2.0 ±0.2 cm based on 10 measurements adjacent to each clump). The vegetation was species-rich (20-30 species m^2) and had good fit to *Brachypodium pinnatum-Bromus* [*Bromopsis*] *erectus* grassland (74% fit to CG5a, typical sub-community) as described by the National Vegetation Classification (NVC) (Rodwell 1992). The most abundant species were *Bromopsis erectus*, *Festuca ovina*, *Helianthemum nummularium*, *Sanguisorba minor* and *Thymus polytrichus* (Table 1). This appeared to be the only area of short-turf CG5a as the majority of slopes supported taller CG5a *Brachypodium pinnatum-Bromus* [*Bromopsis*] *erectus* grassland. The only other threatened species present was *Astragalus danicus*, a few patches of which occurred within a few metres of the *Pulsatilla*. The slope forms part of the Swinstead Valley SSSI, notified in 1989 for its species-rich limestone grassland, although *Pulsatilla* and *Astragalus* are not mentioned in the citation.

This appears to be the first discovery of a new population of *Pulsatilla* in England for over 100 years as the majority of new twentieth century records appear to be rediscoveries of old sites or simply the first published accounts of long known sites (Walker *et al.* in prep). Of the 120 or so known populations only 18 survive in 19 10-km squares (Table 2). Half of these sites, including Swintead Valley, hold less than 100 plants whereas the three largest populations support around 150,000 in total (Therfield Heath, Barnack Hills and Holes, Barnsley Wold). In Lincolnshire Gibbons (1975) noted that *Pulsatilla* was ‘formerly widespread on [Jurassic] limestone grassland in the County’. This is likely to be an over-estimate as the records for vcs 53 and 54 show that it has always been a localised plant (Table 3). It was last recorded in North Lincolnshire at Broughton Far Wood (Clapgate Pits) in 1968. It was formerly more widespread in South Lincolnshire where there are records for 18 sites, although some of these may be synonymous. Most were lost during the eighteenth and nineteenth centuries due to the ploughing up of downland following Parliamentary Enclosure (Wells 1968, 1969; Jones 1969). More recent losses, such as at Holywell Mound and Honington Camp, occurred due to agricultural improvement or the loss of grazing on isolated grassland sites. It currently survives on two sites, including the site described in this note. The population at Ancaster Valley faced extinction in the 1980s due to the encroachment of gorse scrub. This has since been removed and grazing re-introduced. A few of the original plants have survived and seed from these have been used to produce plants for reintroduction onto the same slope. *Pulsatilla vulgaris* is classed as Vulnerable in Great Britain under IUCN criteria (IUCN 2001), and is a priority species under the UK Biodiversity Action Plan [http://www.ukbap.org.uk/PrioritySpecies.aspx?group=9]. The discovery of the Swinstead population therefore represents a very significant new discovery both locally and at a national level.

It is intriguing to speculate as to why the *Pulsatilla vulgaris* population on this site has been over-looked until now. Its early flowering time, perhaps when many botanists are less active, combined with a small population on a part of the site with no public access until relatively recently (access permitted to open country (downland) following enactment of the Countryside & Rights of Way Act 2000) may be possible explanatory factors. It is very probable though, given the habitat, location and association with *Astragalus danicus* that this is a truly native locality for this most charismatic of grassland species.

A more thorough survey of the slope and the whole site is planned for 2010 will hopefully reveal a more extensive population.

This article also appeared in Watsonia 28, 79-84 (2010)

Postscript - Chris Howes and Kevin Walker visited the site in early May 2010. Eighteen flowers in nine clumps were recorded.

Acknowledgements

We thank James Marshall of Natural England for seeking formal access permission to undertake a detailed assessment of the population and to describe the associated vegetation. Permission was granted by the Grimsthorpe Estate (Chris Howes) to whom we are very grateful. We are also grateful to Clare Pinches and Phil Horton for their comments on an earlier version of this note.

References

GIBBONS, E.J. (1975) *The Flora of Lincolnshire*. Lincolnshire Natural History Brochure No. 6, Lincolnshire Naturalist's Union, Lincoln.
JONES, .F. (1969). The decrease of *Pulsatilla vulgaris* in England. *Biological Conservation* 1, 327-328.
IUCN (2001) *IUCN Red List Categories and Criteria*: *Version 3.1.* IUCN Species Survival Commission, IUCN, Gland, Switzerland and Cambridge, UK.
RODWELL, J. S. ed. (1992). British Plant Communities. Volume 2. Grassland and montane communities. Cambridge University Press, Cambridge.
WALKER, K. J., PINCHES, C. E. & WELLS, T.C.E. (in prep) Under-grazing and the decline of *Pulsatilla vulgaris* Mill. (Ranunculaceae) in England, UK.
WELLS, T.C.E. (1968). Land use changes affecting *Pulsatilla vulgaris* in England. *Biological Conservation* 1, 37-44.
WELLS, T.C.E. (1969). The decrease of *Pulsatilla vulgaris* in England – A reply to Dr. E.F. Jones. *Biological Conservation* 1, 328-329.

Table 1. Percentage cover of species growing with *Pulsatilla vulgaris* in Swinstead Valley SSSI, Lincolnshire (1m^2 quadrats)

Species	Q1	Q2		Q1	Q2
Brachypodium pinnatum	4	8	Leontodon hispidus	2	12
Briza media	+	+	Linum catharticum	+	+
Bromopsis erectus	15	12	Lotus corniculatus		3
Campanula glomerata	+	1	Medicago lupulina		2
Campanula rotundifolia	+	1	Picris hieracioides	+	
Carex caryophyllea	+	+	Pilosella officinarum	2	5
Carex flacca	4	1	Primula veris	+	1
Carlina vulgaris		+	**Pulsatilla vulgaris**	**+**	**+**
Cirsium acaule	10		Sanguisorba minor	15	25
Crataegus monogyna		+	Scabiosa columbaria	2	2
Festuca ovina	20	15	Senecio jacobaea		+
Galium aparine		+	Succisa pratensis	+	
Galium verum	1	+	Taraxacum officinale	1	+
Helianthemum nummularium	15	5	Thymus polytrichus	10	12
Helictotrichon pratense		+	Viola hirta		+
Koeleria macrantha	+	+	**Number of species**	**23**	**28**

Table 2. Extant sites for *Pulsatilla vulgaris* in England with indication of geology, management and population size.

Site	VC	10-km	Geology/mgt	Size
Church Hill, Therfield Heath	20	TL33	Chalk, winter grazing	E
Aston Upthorpe Down	22	SU58	Chalk, ungrazed exclosure	B(R)
Steps Hill, Incombe Hole	24	SP91	Chalk, intermittent grazing	B
Devil's Dyke-Newmarket Heath	29	TL66?	Chalk, part grazed/ungrazed	C
Barton Hills	30	TL03	Chalk, grazed exc. 1-3	D
Ravensburgh Castle, Barton Hills	30	TL02	Chalk, ungrazed	B
Deacon Hill	30	TL12	Chalk, part grazed/ungrazed	A
Knocking Hoe	30	TL13	Chalk, grazed	D
Barnack Hills and Holes	32	TF00	Limestone, grazed exc. 3-9	E
Barnsley Wold Warren	33	SP00	Limestone, grazed exc. 3-5	E
Beaumonts Hay	33	SP12	Limestone, irregular grazing	A
Bourton Downs	33	SP13	Limestone, grazed exc. 4-8	C
Hornsleasow Roughs	33	SP15	Limestone, grazed exc. 3-5	C
Taylor's Hill, Hilcot	33	SP01	Limestone, grazed	C
Rodborough Common, Minchampton	34	SO80	Limestone, light mowing/grazing	B
Ancaster Valley	**53**	**SK94**	**Limestone, winter grazed**	**B(R)**
Swinstead Valley	**53**	**TF02**	**Limestone, summer grazed**	**A**
Ledsham	63	SE43	Limestone, winter grazed	A(R)

Code for population sizes: A, 1-10; B, 11-100; C, 101-1000; D; 1001-10000; E; 10000-100000; (R), includes reintroduced plants.

Table 3. Recorded sites for *Pulsatilla vulgaris* in Lincolnshire with indication of the year of the first and last record where populations are now known to be extinct. Listed in order of the year of last record

Site	VC	Hectad	First record	Last record
Lincoln Heath (Blackstone Hill)	53	SK96	1746	1746
Ropsley Heath	53	SK93	1790	1790
Colsterworth (part of Lincoln Heath)	53	SK92	<1800	1800
Ashby-de-la- Launde	53	TF05	1836	1836
Brauncewell	53	TF05	1800	1855
Billinghay	53	TF15	1873	1873
Great Ponton, Stoke Rochford, between	53	SK93	1886	1886
Great Ponton	53	SK93	1886	1891
Grantham	53	SK93	1893	1893
West Willoughby Quarry (Copper Hill), Ancaster	53	SK94	1886	1894
Temple Bruer	53	TF05	1900	1900
Stamford, near	53	TF00	1928	1928
Byards Leap, near	53	TF04	1944	1967
Heydour Warren, Ancaster	53	SK94	1967	1967
Holywell Mound	53	TF01	1948	1988
Honington Camp	53	SK94	1914	1992
Ancaster Valley	53	SK94	1886	Extant
Swinstead Valley	53	TF02	2009	Extant
Glentham, near	54	SK99	1878	1878
Stainton le Vale	54	TF19	1878	1878
Epworth	54	SE70	1895	1895
Castlethorpe	54	SE90	1857	1903
Broughton Far Wood	54	SE91	1875	1969

INTERESTING DIPTERA AT WHISBY

Phil Porter

Although there were some interesting hoverfly occurrences at Whisby this year I have not succeeded in getting the identifications confirmed properly and the results will be available for next year's issue of The Lincolnshire Naturalist. However, two confirmed instances of interest concerned the scarce Tipulid *Nephrotoma crocata* and the coastal Therevid *Acrosathe annulata*.

Alan Phillips caught the *Nephrotoma* on 12th May whist searching for hymenoptera on the Sandhills area of Whisby so the bright yellow and black Tipulid caught his eye particularly. This species is acknowledged as a heathland indicator and is rated RDB3 by Buglife on its webpage. Allan's identification was confirmed by Chris Shortall of Rothamstead Insect Survey and Andy Godfrey.

The Therevid was also caught in the Sandhills by Richard Davidson on 12th July and proved to be *Acrosathe annulata* which is reasonably frequent in coastal dunes including those of Lincolnshire, but which according to Stubbs and Drake 2001, 'there are some inland records from other sandy districts, such as in the Breck district of East Anglia and Hartlebury Common, Worcestershire, but in these days of intensive agriculture it is likely that such occurrences are exceptional.' The Sandhills of Whisby only cover about 4 hectares or so, making its occurrence all the more surprising. The specimen also bore dark thoracic hairs which according to the same reference 'is more typical of the European form of *annulata'*. Alan Stubbs (pers. comm.) indicated that as the specimen was a female, where the identification criteria are much more vague, no further determination could be made at the moment.

Reference

STUBBS A. & DRAKE M. 2001. *British Soldierflies and their Allies*. British Entomological & Natural History Society. 512pp.

NON-MARINE MOLLUSC COLLECTION DONATED TO LNU COLLECTION AT RISEHOLME

E.J. Redshaw

The important late 19th and early 20th century non-marine mollusc collections from Lincolnshire, formed by C.S. Carter including material from John Hawkins and Miss Catherine Stow, both of Grantham, the collections of J.F. Beetlestone of Market Rasen together with the more recent material collected by E.C. Riggal were acquired by the writer following the death of Riggall in 1976. These collections have now been passed to the LNU for inclusion in the Union's Collection at Riseholme.

Of particular importance in the collections are examples of two species now extinct in the county.

Myxas glutinosa was found in abundance in a drain near Tetney in April 1902 by Carter and H.W. Kew (last recorded in the county from the Mar Dyke at Saltfleetby in 1905 and now nationally rare), and *Segmentina nitida*, also from Saltfleetby in 1902 and extinct in the county since 1928.

The collection also contains a wide range of scarce and common Lincolnshire snail, mussel and pea mussel species, together with Beetlestone's collection of banding variations and colour morphs of *Cepaea nemoralis*.

LINCOLNSHIRE NATURAL HISTORY IN 2009

MOTHS

Colin Smith

There were several factors that influenced moth records in 2009. Firstly we had a winter which probably helped survival rates of resident species so the overall numbers of moths seen was high. It was, on the other hand, a very poor year for migrants. The third and perhaps most significant factor was that records were submitted by several new recorders and I have received 35,000 records for 973 species. Thanks are due to everyone who contributed but especially to Alan Dale who sent me almost a thousand records, many with notes and all without the use of a moth trap.

Of the very few migrants, two were of note. The first was a vestal *Rhodometra sacraria* by Chris Howes at Grimsthorpe Park on 4th July and Phil Horton lent his trap to John Creedy in Thurlby who caught a striped hawk *Hyles livornicaon* 31st August. Geoff Wright caught a good proportion of the other migrants reported with the only two convolvulus hawks *Agrius convolvuli*, the only two bordered straws *Heliothis peltigera* and one of the two white points *Mythimna albipuncta*. In June, I caught a female bedstraw hawk *Hyles galii* in the Market Rasen area where there is almost certainly a breeding colony of this splendid, normally migrant species. There were also 14 reports of hummingbird hawk *Macroglossum stellatarum* which also would indicate that they are surviving hibernation and breeding in the county. Another species that is colonising the county is dusky-lemon sallow *Xanthia gilvago*; the five records this year is equal the total for 2006 when migration was exceptional and it almost certain that it is resident now.

Dusky lemon sallow Photo M. Gray

The colder winter favoured the declining garden tiger *Arctia caja* with an encouraging 13 scattered records the highest total this century. Other species that had a good year where the mallow *Larentia clavaria*, brown scallop *Philereme vetulata* and 72 records for gold spot *Plusia festucae,* four times the norm. Another species that bounced back was the obscure wainscot with five records more than in the previous ten years together and back at the levels seen in the eighties and nineties. A single record for Webb's wainscot *Archanara sparganii* (Page 212) at Saltfleetby-Theddlethorpe NNR on 14th August was the fifth county record. Lawrie Poole caught a Jersey tiger *Euplagia quadripunctaria* in his garden at Thorpe on the Hill on 11th August which was the first Lincolnshire record. Whether it got there on its own or had some help will probably remain a mystery, but one was found in Yorkshire last year. He also caught one of the three blotched emeralds *Comibaena bajularia* that were found in the north of the county after an absence of fifteen years. Another unexpected find was a four-spotted in Derek Foxe's garden at Langworth (a UK BAP species); this is well north of its home in Cambridgeshire and south Lincolnshire. Martin Gray found a second breeding site in the county for hornet moth *Sesia apiformis* with a newly emerged specimen near Sleaford. Triangle *Heterogenea asella* was found at Moor Farm nature reserve, the fifth record and a third site for this nationally scarce species. Marsh moth *Athetis pallustris* also did very well, 76 larvae were found at the main colony and some of these were taken to an old site to try to re-establish a second colony. Alf McGowan recorded an oblique carpet *Orthonama vittata* at Caistor on 20th August, only the third record this century. The fifth record this century of chamomile shark *Cucullia chamomillae* was recorded by Liz White on 23rd April at Frampton. On the down side I have only six records for five-spot burnet *Zygaena lonicerae*. After much publicity to try to record the species, there were quite a lot of six-spot reported but I fear the five-spot is in serious decline.

Hornet moth Photo M. Gray

Two LNU field trips included moth nights. The first was at Crowle Moor where 186 species were recorded including forester *Adscita statices* (a UKBAP species), leopard moth *Zeuzera pyrina,* oak eggar *Lasiocampa quercus,* beautiful yellow underwing *Anarta myrtilli*, striped wainscot *Mythimna pudorina*, mere wainscot, round-winged muslin *Thumatha senex*, Kent black arches *Meganola albula* and great oak beauty *Hypomecis roboraria*. The other moth night, organised to coincide with National Moth Night, was at Humberston Blow Well and was not quite as prolific. During the day I recorded 20 species including larva and leaf mines and then 23 species came to light in the evening, the best being twin-spotted wainscot *Archanara geminipuncta*.

It was not a particularly good year for recording micros. The second highest yearly total of 6,000 represents a growing interest from more recorders rather than more moths. There were 520 species recorded which is about average. The increased interest and knowledge over the last few years has filled in a lot of the gaps in the list of species so there have been only 5 new county records and 2 new vice-county records during 2009.
Ectoedemia quinquella - Janet Rowley at Swinderby on 9th June new county record.
Antispila metallella - Martin Gray leaf mine at Skellingthorpe on 1st October new VC53.

Phyllonorycter esperella – Martin Gray leaf mine at Lincoln on 25th September new county record (Page 212).

Acleris logiana – Colin Smith at Linwood Warren on 18th September and Martin Gray at Broadholme on 27th October new in both VC's.

Acleris logiana Photo M Gray

Epinotia maculana – Chris Dobson at Hardy Gang Wood on 22nd October new VC54 and second county record - the last over 100 years ago.

Dichrorampha alpinana – Martin Gray at Saxilby Flood on 31st May and Colin Smith at Woodhouse on 15th June new in both VC's (Page 212).

Perinephela lancealis – Roger Labbett at Kirkby Moor on 1st July new county record.

Perinphela lancealis
Photo R. Labbett

BATS

Annette Faulkner

As always the year started with January and February surveys of hibernation sites, of which eleven are regularly surveyed, from the flagship SSSI at Withcall to other much smaller sites. All are subterranean save two. Barbastelles B*arbastella barbastellus* were found at 3, all singletons and at opposite ends of the county.

Bats emerge from hibernation in mid-March and there are always a few grounded bat calls in the next few weeks as old and out-of-condition animals get into trouble. There is then usually a lull until around late June, when orphaned/ abandoned/ lost babies and juveniles start to appear on the scene. Most of these bats are pipistrelles *Pipistrellus sp*, but in 2009 we also had 20 brown long-eareds *Plecotus auritus*; 2 whiskered/ Brandt's *Myotis mystacinus/ Brandtii* females, one of which died, the other, from Cranwell, was released and 3 noctules *Nyctalus noctula*, one of which turned up in someone's kitchen at Moulton Seas End, and was released after feeding up, one of which had a badly broken wing and had to be euthanased, and the last one, from Grantham, which died shortly after collection, we suspect had been struck by a hobby *Falco subbuteo.*

At Tattershall church and castle, which have a large population of six species of bats, there was the usual run of casualties, all pipistrelles or Daubenton's *Myotis daubentonii*. In some years a mysterious virus-type illness affects large numbers of juvenile pipistrelles here, from which none appears to survive, but 2009 was not one of these years, and there were only six casualties. A further grounded Daubenton's was found at Hartsholme Country Park in Lincoln, which was fed up and released.

As always the Bat Group members who are licensed by Natural England to carry out roost visits were busy. As expected most (14) were for pipistrelle roosts, but there were also 5 brown long-eared roosts, 7 combined pipistrelle and brown long-eared roosts (mostly in churches), and one site containing both Natterer's *Myotis nattereri* and brown long-eared bats. Interestingly, a third of these calls were to previously recorded sites, mostly churches, but one was to a long-eared roost in a farmhouse first recorded in the early 1990s, illustrating how faithful long-eareds are to their roost sites.

Finally, the bat group attended a number of events and shows over the summer months, in the process gathering many more records, including those of new roost sites, where we were able to talk householders through any worries, give them plenty of information and the details of their local bat worker.

BOTANY

Paul Kirby

Seven field meetings were held in 2009:

April 26	South Thoresby Pit, TF47 and South Thoresby Warren LNR, TF37
May 31	Roberts Field LWT Reserve, TF01
June 7	High Barn SSSI, TF37
July 4	Crowle Moor LWT Reserve, SE71
August 23	River Glen, Baston Fen, TF11
September 19	Humberston, South Sea Lane Blow Wells, TA30
October 18	Fungus Foray. Roughton Moor Wood LWT Reserve, TF26.

Clustered clover Photo B. Meek

New county records

Clustered clover *Trifolium glomeratum*. Bill Meek found this nationally scarce clover on June 2nd in close cropped, open sandy grassland at Cleethorpes, TA 3107. At least 20 plants were noted at this its most northerly native British station. Described as 'very erratic in time, space and vigour' (Stewart *et al.*, 1994), it is possible this small clover has been present for some time, hidden among the other small clovers at the site, notably rough and knotted *T. scabrum* and *T. striatum.*

Red duckweed *Lemna turionifera.* In May 2007 the first British record of red duckweed was made in Dorset, Vc9. Later, in July that year, it was found in the South Forty Foot Drain in TF13 in South Lincolnshire (Lansdown 2008). In 2009 R. V. Lansdown found further sites in Vc53, in TF22. The discovery of the plant in such widely separated Vice-counties suggests that it may be widespread. It is one to look out for. Red duckweed resembles 'an olive-green form of common duckweed *Lemna minor* or fat duckweed *L. gibba* flushed with red pigmentation' (Rich & Jermy, 1998). If the reddish colouration is on the underside around the point of root attachment such duckweeds merit careful investigation. Full details for identification are given in Lansdown 2008.

Rough cocklebur *Xanthium strumarium* – a single plant in a vegetable garden in Marton, SK88, Brian Hedley. Confirmed Eric Clement, BSBI. Casual. It is a recognised contaminant of carrot seed and this was the likely source here.

Rough cocklebur
Photo B. Hedley

A sample of the records received in 2009 (date 2009 unless stated otherwise)

Rough marsh-mallow *Althaea hirsuta* – 6 plants in flower on an industrial site in TA11, Andrew Chadwick. Casual. Described by some as possibly native at some sites in southern England and a Red Data and Schedule 8 plant but considered a probable introduction by Stace (1998) and listed as a neophyte in Atlas 2000, (Preston et al., 2002). Introduced in Lincolnshire.

Ribbon-leaved water-plantain *Alisma gramineum* – additional sites for this Red Data plant in TF22, R. V. Lansdown.

Sqinancywort *Asperula cynanchica* - Wilsford Heath, limestone grassland road verge, SK9842, James Gallimore. This new location for what is now a very rare plant in Lincolnshire, (last seen in the county in 2004 close by in Ancaster Valley), was among the discoveries made during the Life on the Verge surveys of limestone sites in southwest Lincolnshire. While recording for this project David Gray turned up populations of pyramidal orchid *Anacamptis pyramidalis* (100+) and bee orchid *Ophrys apifera* (170+) on a limestone outcrop near Saltby, SK8526 and James Gallimore found clustered bellflower *Campanula glomerata* on a road verge near Oasby, SK9938.

Garden orache *Atriplex hortensis* – Verge of A52 in TF45, PK & CH.

Hard fern *Blechnum spicant* – Burwell and Haugham Woods, TF38, David Harrison. This fern was first recorded in these woodlands in 1886 by Miss Susan Allett (Burtt Davy 1890) but has never been re-found until now. An interesting rediscovery.

Moonwort *Botrychium lunaria* – a large population on Risby Warren SE9113. First noted by Morwenna Christian in 2008. PK & JF counted 143 small fronds, 1 – 6cms tall, in 2009. Only extant Lincolnshire site.

Rye brome *Bromus secalinus* – Arable sites at Sandilands TF5280, Barrow Hann TA0922 and Farlesthorpe Fen TF4874, PK & CH and Burwell TF38, Aylesby TA20 and Pyewipe TA21, David Harrison. This grass is now being recorded much more frequently.

Hairy bindweed *Calystegia pulchra* - clambering up a hedge at Scrub Hill, TF25, PK & CH. An uncommon plant in the county. The majority of the Lincolnshire bindweeds with large pink flowers turn out to be the hybrid *Calystegia x howittiorum* (*C. pulchra x silvatica*).

Calystegia sepium subsp. *roseata* – Beside a patch of reed on the Humber bank at Chowder Ness, TA0022, ABP Marine Environmental in 2007. Predominantly a taxon of western Britain with very few confirmed records in Lincolnshire. It is a pink flowered, sparsely pubescent bindweed associated with brackish habitats and one not to be confused with the very similar, but glabrous, pink flowered form of hedge bindweed *Calystegia sepium* subsp. *sepium* f. *colorata*.

Sea bindweed *Calystegia soldanella* – Horse Shoe Point TA3702, David Harrison. A spectacular 30m x 15m patch on the sea bank. A new location.

Soft hornwort *Ceratophyllum submersum* – abundant in Sandilands Pit LWT Reserve, TF5280, Claire Weaver. A new location for a plant very rare in Lincolnshire.

Common calamint *Clinopodium ascendens* – Somersby TF3472, Neil Harris.

Goat's-rue *Galega officinalis* – Walesby Moor Plantation TF1191, David Harrison.

Heath cudweed *Gnaphalium sylvaticum* – 160 plants in Osgodby Moor Plantation, TF0992, David Harrison – 30 plants, in small scattered groups, on Risby Warren SE9213, PK & J. Kirby – a total of 135+ plants at 3 locations in Whisby Nature Park SK96, Phil Porter.

Barberry *Berberis vulgaris* – recorded at 7 locations – Spridlington TF0183, Skendleby TF4369 and Markby TF4878 & TF4978, PK & CH - Moortown TA0600 and Haugh, TF4175 & TF4176, Peter Haywood. In medieval times it was cultivated for its berries to make pickles and scarlet jelly (Mabey 1996) and later planted as hedging and once may have been quite widespread. However many bushes were uprooted in the 19th century when it was recognised as a host for the rust *Puccinia graminis* of wheat crops. It is interesting to see that barberry has survived at Haugh for over 100 years. John Chandler recorded it here in 1886 (J. W. Chandler 1893).

Green hellebore *Helleborus viridis* – A small 1.25m x 0.75m patch at Cotham Nunnery, Keelby, TA1511. Mark Tyszka. First noted here in 1947 by R. N. Barton. Could this be a relic of an ancient medicinal garden – either that of the original Cistercian nunnery (c. 1150 – 1539) or belonging to the house which was subsequently built on the nunnery site and now long gone? The plant has the reputation of being long lived and colonies may persist for many years showing little change in size.

Sea barley *Hordeum marinum* – A few plants on the Humber bank at Chowder Ness, TA0022. ABP Marine Environmental. A nationally scarce annual.

Round-fruited rush *Juncus compressus* – Owston Ferry SK8099, JF.

Common broomrape *Orobanche minor* – Donna Nook LWT Reserve TF4496, John Walker & David Harrison. A very large population on the sea bank. First noted here in 2001.

Flat-stalked pondweed *Potamogeton friesii* - Bishop Bridge SK9473, Nick Kite.

Long-stalked pondweed *Potamogeton praelongus* – 3 patches in the south Idle Drain SE7301, JF. Confirmed by Dr Nigel Holmes, BSBI Potamogeton referee. The first Lincolnshire record for nearly 30 years. Dr Holmes commented 'does seem to be making a great comeback'.

Pasque flower *Pulsatilla vulgaris* – Swinstead Valley TF02, Richard Jefferson & Fiona Hart (Jefferson & Walker 2010). The discovery of this new site is reported in a separate article in this journal.

Sparganium erectum subsp. *oocarpum* – Winteringham, SE9122, John Bratton. Branched bur-reed *Sparganium erectum* is widespread in Lincolnshire but no work has been done in the county on the distribution of the four subspecies. These can only be separated late in the year on details of the ripe fruit. It is possible that all four are present in the county.

Greater chickweed *Stellaria neglecta* – on the bank of the River Lymn in TF36, PK & CH. There are very few records for this plant in Lincolnshire.

Large thyme *Thymus pulegioides* – Surprisingly large thyme was found at two new sites in 2009. Osgodby Moor Plantation in TF09, David Harrison and Tattershall Pits in TF25 by Keith Robertson. A very rare plant in Lincolnshire.

Crimson clover *Trifolium incarnatum* subsp. *incarnatum* – casual on the dunes at Mablethorpe, TF5085, Stuart Smith.

Wall germander *Teucrium chamaedrys* – Walesby Grange, railway bank TF1190, PK. Still flourishing at the location first described by Dr. F. A. Lees in 1877. Thought to have originated from the gate-keeper's cottage garden.

Many thanks to all who sent in records in 2009

References

BURTT DAVY, J. 1890. *Diary*. Unpublished.
CHANDLER, J. W., 1893. *Diary 1886 – 1893*. Unpublished.
GIBBONS, E. J., 1975. *The Flora of Lincolnshire*. Lincolnshire Natural History Brochure No. 6. Lincolnshire Naturalists' Union. Lincoln.
JEFFERSON, R. G. & WALKER, K. J., 2010. An over-looked population of Pulsatilla vulgaris Mill. in South Lincolnshire (v.c. 53). *Watsonia*, 28, Pt. 1 February 2010.
LANSDOWN, R. V. 2008. Red Duckweed (Lemna turionifera Landolt) new to Britain. *Watsonia*, 27, Pt. 2. August 2008.
MABEY, R., 1996. *Flora Britannica*. Sinclair-Stevenson.
PRESTON, C. D., PEARMAN, D.A. & DYNES, T.D., 2002. *New Atlas of the British & Irish Flora*. Oxford.
PRESTON, C. D. & CROFT, J. M., 1997. *Aquatic Plants in Britain and Ireland*. Harley Books.
RICH, T. C. G. & JERMY, A. C., 1998. *Plant Crib 1998*. BSBI. London.
STACE, C. A. 1997. *New Flora of the British Isles*. 2nd Edition. CUP.

Key to initials in text
JF, Jeremy Fraser - CH, Colin Hutchinson – PK, Paul Kirby

BUTTERFLIES

Allan Binding

By the end of 2009 I had received over 11,000 records. This was very helpful as 2009 was the last year of the present 5 year recording period for the next National Butterfly Atlas, to be published in spring 2010. 2010 is the first year of the next five year recording period for the next atlas due to be published in 2014 so please keep recording butterflies. This information is used by Butterfly Conservation, Defra, environmental records centres and universities.
Any 2009 butterfly records that have not been sent in yet are still welcome but will be too late to be used in the current update to the National Atlas as records for the atlas had to be in by the end of January.

2009 turned out to be the best year for most butterfly species since 2006. After two very wet summers most butterfly species were recorded in good numbers with counts of some species being in three figures. Butterfly numbers increased rapidly by late June and early July aided by the huge migration of painted lady from Africa and southern Europe. In Lincolnshire most of the painted ladies were seen flying in a north-westerly direction in large numbers. Other migrant species did not do so well. Very few red admiral and clouded yellow were seen.

Large white and small white were very common, although green-veined white, small copper and small heath did not fare so well.

Grayling are under threat due to lack of suitable habitat as many of the old iron ore quarries are being filled in or built on but in 2009 they were seen in good numbers in their few remaining sites.

In the last few years white-letter hairstreak has been targeted for a National Survey by Butterfly Conservation. 10km Grid Squares were picked at random and in Lincolnshire these squares were surveyed by Martin Greenland. Both the butterflies and the elm trees on which the larvae feed were noted and plotted on a map. These records were added to the Lincolnshire database. This has expanded our knowledge of the distribution of this species within the county.

Two dark green fritillaries were recorded in the county in 2009, one at Chambers Farm Wood on the 16th August and the other in Humberston district on the 18th August. These may have come from the known colony on the north Norfolk coast. Thanks are due to all Lincolnshire Naturalists Union and Butterfly Conservation Lincolnshire Branch members who sent in records in 2009.

FRESHWATER INVERTEBRATES

Richard Chadd

The highlights of 2009 mostly relate to caddisflies (Trichoptera), with a particularly exciting find being a larva which appeared to be that of the 'caseless' species *Tinodes maculicornis* (Pictet) in the River Witham at North Witham (SK9294821411). This species is known only from Ireland, so a find in Eastern England would be truly significant! The specimen was sent to the National Recorder at Liverpool World Museum (Ian Wallace), who agreed that the specimen was most unusual, but identified it (though not with great conviction), as *Tinodes maclachlani* (Kimmins). This species has been found in Lincolnshire before (in Winterton Beck near Scunthorpe), but the 2009 record represents only the second occurrence of *T. maclachlani* in the county, so is still noteworthy. The species is usually associated with vertical trickles on cliffs, but can be found on horizontal bedrock, as here.

Another 'caseless' caddis larva of the Nationally Notable spring-head specialist *Hydropsyche fulvipes* (Curtis) was found by Environment Agency staff in upper Torrington Beck at Hainton (TF1779285289). This is an unconfirmed record, as the specimen was destroyed before I was able to see it, but the habitat and location are appropriate and I have no particular reason to doubt the determination. The species is known from Lincolnshire, particularly from chalk spring heads in the north-western Wolds, but there are very few records and it appears to be a genuine rarity.

A larva of the 'cased' species, *Limnephilus fuscicornis* (Rambur) was found in Brimmer Beck, a tributary of the River Rase north of Market Rasen (TF1056990138). The species is unusual in favouring streams and rivers with a sandy bed, a substratum usually avoided by caddis larvae. This makes its national distribution somewhat localised and it is quite rare in Lincolnshire – this is only the fifth record of the species, all of these since 2001.

A number of regionally and nationally notable caddis species, reported in previous editions of *The Lincolnshire Naturalist*, maintained good populations in 2009, mostly in Wolds rivers, especially the upper River Rase. These included the 'caseless' species *Rhyacophila septentrionis* McLachlan, *Wormaldia occipitalis* (Pictet) and *Tinodes unicolor* (Pictet) and the 'cased' species *Silo nigricornis* (Pictet) and *Crunoecia irrorata* (Curtis).

Apart from caddisflies, another highlight was the discovery of a specimen of the little pond skater *Gerris argentatus* Schummel in Buck Beck at Cleethorpes (TA2989606494). The species is mostly confined to the south-east of England, and, though records extend to south-west Yorkshire and Devon, it is decidedly local and a definite rarity in Lincolnshire - the county does not feature for this species in the most recent provisional atlas of water bugs.

BRYOPHYTES

Christine Rieser and Frank Lammiman

2009 has not been a very good year for bryophyte recording due to the long summer drought when mosses were tightly closed and curled up to protect themselves from dehydration. In this condition they are difficult to distinguish in the field. However some good records were made.

Leafy liverworts are scarce in Lincolnshire due to the dry climate and we were pleased to find some *Jungermannia gracillima* together with a rather unusual form of *Calypogeia fissa* in the wet pond margin at Linwood Warren. A thalloid liverwort, *Riccardia multifida* was found on constantly wet track in Haugham Wood with *Pellia endivifolia* indicating a calcareous habitat, which was interesting as *R. multifida* has only been found previously on more acidic soils in Laughton Forest area.

Syntrichia papillosa Photo C. Rieser

On the Baston Fen LNU meeting on 23/8/09 an old willow at the car park had a good covering of epiphytic mosses, mostly *Orthotrichum affine* but several good patches of *Syntrichia papillosa* and some *Syntrichia virescens. S. papillosa* is not common nationally and is considered to have declined during the years of atmospheric pollution. In Lincolnshire it has been recorded in small quantity at Gibraltar Point but was present here as several large pure patches. It is a rather beautiful moss having multiple globular gemmae produced on the surface of the leaf along the costa. When the leaf is dry the margins fold up over the gemmae so that they are released only in conditions of moisture to encourage viability. The *Syntrichia virescens* has leaves with a long toothed hairpoint and a waisted shape. It is also not very common but has been recorded recently in a few scattered locations, usually in woodland

Also in the Baston Fen area along the River Glen banks a wealth of *Leskea polycarpa* was seen on old willows. This is not common in Lincolnshire and is restricted to sites close to variable water level.

Leucobryum glaucum Photo C. Rieser

The LNU meeting at Roughton Moor Wood gave us another location for *Leucobryum glaucum*, displayed as a rather whitish moss because in drought conditions air is drawn into pores in the leaf cells which then reflect the light. *Dicranum montanum*, a small fairly uncommon epiphytic moss was also seen here with dry screwed-up leaves. This site also gave us the moss *Tetraphis pellucida* with the rarely formed spore capsules as well as the usual gemmae cups for asexual reproduction. The capsules have only four peristome teeth, a feature only seen in one other rare moss genus. It has been recorded with capsules before in Lincolnshire at Linwood Warren but the capsules are generally quite rare.

Dicranella heteromalla v.sericea
Photo C. Rieser

At Benniworth Haven an interesting variety of the common moss *Dicranella heteromalla* has been recorded on the exposed sandstone. *D. heteromalla v. sericea* displays with very fine leaves, not all turned in one direction as in the common plant.

More work on the churchyards elicited records for *Gyroweisia tenuis* and *Bryum violaceum*, both previously recorded only rarely and *Rhyncostegiella tenella* was recorded at Stainton-le-Vale Church, unusually with capsules.

The recent revision of the species of the *Schistidium apocarpum* complex has led to the renaming of our local moss as *S. crassipilum*. Seen at Welton-le-Wold

Church, it has been verified by the BBS recorder and ranks as a new vice county record (Page 212).

The most remarkable find for 2009 was the discovery by Colin Wall of a small patch of *Ptilium crista-castrensis* on willow at Haxey Grange Fen. This is a spectacular moss which normally grows on acid soil in montane woodlands and is only previously recorded from lowlands in coniferous woodland in East Anglia where it is thought to be introduced.

Ptilium crista-castrensis Photo C. Rieser

FUNGI

Ray Halstead

'What a strange year it has been with the fungi this year'. This seems to be a regular opening for the fungi reports of recent years and this year been no exception, maybe global warming is having an effect in spite of what we may read elsewhere. The few forays that I managed to attend this year were producing results at least 50% down on 'normal' years and this could almost certainly be attributed to the very dry period that we experienced throughout September.
I visited my local woods around Market Rasen at the end of August after a spell of unseasonably damp weather and in only a short space of time recorded a good number of species that I would have expected to find a month or so later. The same could be said at Linwood Warren where we had a family fun day in August (as part of the Trust's 60th anniversary celebrations). I took the children to enjoy the activities put on by the volunteers only to find the most interesting thing about the day was the amount of fungi to be found which resulted in an impromptu fungus foray. Unfortunately we didn't take all of our foraying kit with us, had we done so I am sure we could have trebled the number of species recorded (10) in the short time we spent there. Of particular interest that day was an unusual Boletus growing under a silver birch (*Betula pendula*) that turned out to be *Boletus edulis var betulicola* (Photo 1), a very large specimen, cap diameter 200mm and much paler than a typical *Boletus edulis* being, as described by Moser, light ochraceous with a whitish stipe.

Photo 1.
Boletus edulis var betulicola
Photo R. Halstead

The public foray at Whisby Nature Park was, as usual, well attended though I suspect a few members of the public went home a little disappointed. Again, due to the unseasonably dry conditions there were very few typical fungi, i.e. the agarics, to be seen, almost half of the list were rusts and smuts and powdery mildews.

The middle of October saw me and my junior assistant at Normanby Hall Country Park near Scunthorpe where I had been asked by North Lincolnshire Council to do a public foray for them. Given the dry conditions and the nature of the soil in this part of the county I wasn't particularly hopeful of finding a large number of species. True to form very few of the species that one would expect to find growing on bare soil or in the grass were to be found, 70% of recorded specimens were growing directly on wood, i.e. stumps, branches or twigs. Of particular note here were the amount of honey fungus *Armillaria mellea* (Photo 2), which seemed to be almost everywhere in the Park, indeed they have been one of this seasons successes occurring in profusion almost everywhere from ancient woodland to urban gardens.

Photo 2. Honey fungus *Armillaria mellea* Photo R. Halstead

This year the LNU annual foray took place at Roughton Moor Wood near Woodhall Spa on 18th October. As usual it was quite well attended with sufficient numbers for us to split up into two groups with myself leading one group and Ken Rowland taking the other ably assisted by Jackie Freeman. So far we have amassed a total of 54 specimens for this occasion which may seem a little low for the venue but considering the conditions was not too bad.

Of particular note here for me was my first meeting with the genus *Geastrum,* though I have to admit that the specimens that we found, *Geastrum triplex*, (Photo 3), I had managed to walk past, were it not for another member of the group I would have missed them completely.

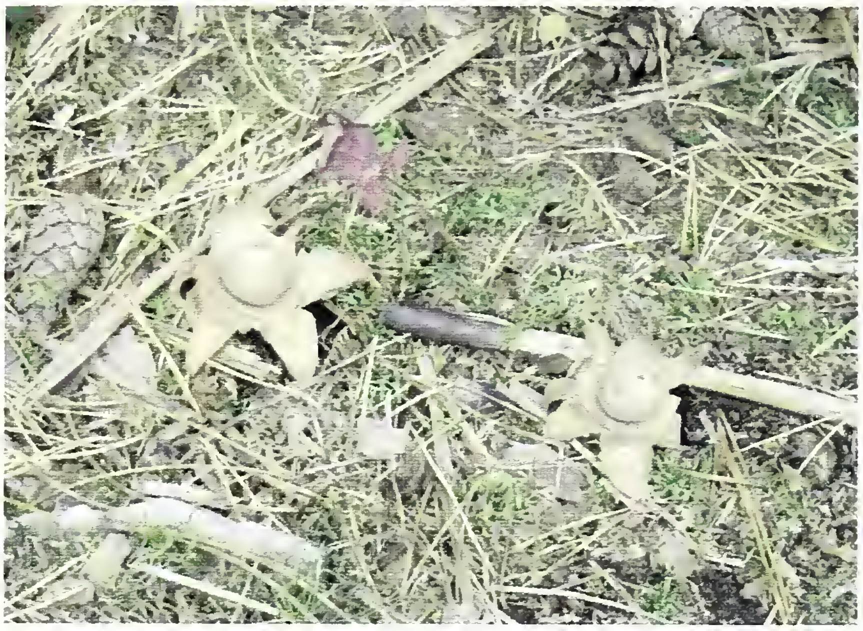


Photo 3. *Geastrum triplex* Photo R. Halstead

The Chamber's Farm Wood foray on 24th October was very well attended by members of the public due to it being advertised in the national press as part of a programme of 'Food for free' events. When it was explained to the gathered masses that this was in fact a recording exercise and we were not going to be gathering mushrooms to take home a few of them were rather disappointed. I was not sympathetic! As I explained to them the fungi that I eat come from my local supermarket, I can be fairly certain of what I am eating and it reduces the pressure on what is rapidly becoming a precious resource especially when we have relatively poor seasons as this one seems to have been. However those members of the public who did manage to stay for the duration were rewarded with a good number of species to learn about and observe. A total of 65 were recorded on the day, nothing of particular noteworthiness but a good variety nonetheless.

Towards the end of November, when I have usually packed away the foraying equipment, I was asked by the owner to accompany her around Kettlethorpe Woods where I was assured there were lots of fungi to be found. I duly obliged and wasn't disappointed; there were indeed lots of fungi the majority being *Gymnopilus penetrans.* This was fruiting very well no doubt due to the recent clearing work that had been done in the woods, the removed timber and brash having been shredded and left on the woodland floor. Of particular note here was a bright purple jelly fungus *Ascocoryne sarcoides* that we found growing on a silver birch *Betula pendula* stump and for the second time this year I happened upon a fungi with a most appropriate common English name, 'My Cat's Been Sick In The Grass' otherwise known as *Mucilago crustacea.*

Many thanks to all those who have helped in this my first year as Fungi Recorder especially Ken Rowland and Jackie Freeman. Though the transfer of recording duties is only slowly taking place, (due mostly to my part), it has been made so much easier thanks to Ken's input and Jackie's help when I have not been available. Thanks to those of you who have provided me with records and queries this year.

I must take this opportunity to say a special thank you to Cathy Wilson who has kindly donated Peter's collection of fungi slides.

SHIELDBUGS

Annette Binding

Only fourteen of the twenty-one species previously recorded in Lincolnshire were recorded in 2009. Generally numbers seemed to be down on previous years but this could be due in part to the smaller number of records received. My own recording in Lincolnshire was somewhat limited as work took me out of the county for much of the summer. Altogether I received 110 records.

No new species were added in 2009. For many of the fourteen species recorded I received only one or two records. These included pied shieldbug *Sehirus bicolor, Sehirus luctuosus, Dolycoris baccarum, Picromerus bidens* and *Rhacognathus punctatus*.

The green shieldbug *Palomena prasina* continues to do well. It is usually the species for which I receive most records but in 2009 it was overtaken by the birch shieldbug *Elasmostethus interstinctus* and the hawthorn shieldbug *Acanthosoma haemorrhoidale*. However, there were only three records of the related species the parent bug *Elasmucha* grisea which continues to appear to be scarce. It is possible that this species is being overlooked. Also, unlike the other two species, the parent bug does not seem to be attracted to either MV or actinic light. Many of Colin Smith's records of birch shieldbug and hawthorn shieldbug were from light traps. Colin also recorded the forest bug *Pentatoma rufipes* at both MV and actinic light traps.

My thanks to Colin Smith, Mark Schofield, Richard Chadd, Adrian Royle and Barry Johnson for sending me records in 2009.

SPIDERS

Annette Binding

At the time of writing this report I have a considerable number of specimens caught in 2009 which are still to be identified so I cannot do a full report. Never-the-less, among those I have identified there was one species which was new to the county, *Gongylidiellum latebricola*. A single male of this Linyphid species was among a small number of spiders collected from moss at Linwood Warren by Colin Smith on 1st January.

Although most of my field work in 2009 was out of the county Allan and I did make some visits to places in Lincolnshire including three visits to Haxey Grange Fen. The main focus of these visits was to try and find the rare mire pill beetle

Curimopsis nigrita but I was also able to take a brief look at the spiders at the site. Among those I collected and later identified was a single female specimen of *Pirata latitans*. There were only nine previous records of this species from six other Lincolnshire sites. I recorded thirty species of spiders at Haxey, twenty-seven of which were new to this under-recorded site.

My thanks to all those people who sent me records and/or specimens in 2009.

TERRESTRIAL BUGS

Colin Smith

There have been two species added to the county list in 2009. The first was *Megalonotus dilatatus* when I found two specimens under heather at Scotton Common on12th February. The other was *Anthocoris limbatus* beaten from willow during the LNU field meeting to Humberston Blow Well on 19th September.

I found several specimens of *Agramma laetum,* a tiny lacebug, at Kirkby Moor on 16th January, a retiring species with few records. Another species that is seldom recorded is the spruce cone bug *Gastrodes abietum*. It is only found in hanging spruce cones which are usually too high to reach. I found some small spruce trees in Twyford Forest on 23rd January with cones containing lots of bugs. Another interesting find was *Dufouriellus ater* at Osgodby Moor on 30th January. There are very few recorded as they are very small and live under bark. While sifting litter piles for marsh moth larva I found *Buchananiella continua* at Gibraltar Point on 29th September, the second county record of this naturalised species.

MOSSES, LIVERWORTS AND LICHENS

M.R.D. Seaward

The county's bryophyte and lichen floras, as mentioned in previous reports, continue to undergo a remarkable change, mainly for the better, as a result of the amelioration of air pollution, off-set by the rise in nitrogenous products derived from agricultural practices and animal husbandry; however, the latter pollutant often increases biodiversity, but this is usually temporary, and clearly the former floras have been usurped. Nevertheless, it is pleasing to note the continued re-establishment of taxa, mainly epiphytes (liverworts, mosses and lichens), throughout much of the county. Of interest in this respect are the lichens, their establishment on young trees, which unlike mature trees have had their barks impregnated by pollutants (thereby lowering the pH) for decades, has been spectacular. The flashes of white thalli of crustose species not seen for more than a century, for example, are noticeable now throughout much of the county, even in suburban settings; similarly, large foliose epiphytes, such as *Parmotrema perlatum* and fruticose *Ramalina* species are also making a welcome return to out county.

More bryological and lichenological work on churchyards produced interesting records, such as the mosses *Gyroweisia tenuis*, *Bryum violaceum* and *Rhyncostegiella tenella*, and a further 11 churches and their churchyards, as well as one churchyard with a demolished church, were visited by the author in 2009 as part of the British Lichen Society's churchyard survey. To date, 549 (representing almost 80% of the C. of E. churchyards in the county) have been lichenologically researched.

The records contributed by N.G. Hodgetts (NGH), F.R. Lammiman (FRL), J. Margetts (JM), C. Rieser (CR), M.R.D. Seaward (MRDS), C.R. Stevenson (CRS), C. Wall (CW) and M. Weaver (MW) are for 2009 unless otherwise stated. As a consequence of this work, four county (*Ptilium crista-castrensis*, *Schistidium crassipilum*, *Arthopyrenia punctiformis* and *Lecanora horiza*), one vice-county (*Ramalina lacera*), 41 divisional and innumerable grid square records have been added to our registers. The bryophyte and lichen nomenclature is mainly according to Hill *et al.* (2008) and Smith *et al.* (2009) respectively.

Mosses

Bryum ruderale Crundw. & Nyholm + 11 (FRL & CR)
B. violaceum Crundw. & Nyholm + 4 (FRL & CR)
Didymodon insulanus (De Not.) M.O.Hill + 4 (FRL & CR)
Gyroweisia tenuis (Hedw.) Schimp. + 11 (FRL & CR)
Hygroamblystegium humile (P.Beauv.) Vanderp. et al. + 13 (on *Sambucus* in swampy woodland, Navenby, 2009, NGH, **VCR**; the first record for the county since 1912)
Hypnum cupressiforme var. *lacunosum* Brid. + 4 (FRL & CR)
Orthotrichum striatum Hedw. + 15 (on *Fraxinus*, Morkery Wood, 2009, NGH, **VCR**)
Ptilium crista-castrensis (Hedw.) De Not. + 1 (On mossy horizontal *Salix* bole, Haxey Grange Fen, December 2009, CW, **NCR**)
Rhynchostegiella tenella (Dicks.) Limpr. + 4 (FRL & CR)
Schistidium apocarpum (Hedw.) Bruch & Schimp. + 13 (on limestone wall, Leadenham church, 2009, NGH, **NCR**)
S. crassipilum H.H.Blom + 7 (Austacre Wood, March 2009, FRL & CR, **NCR**), 8 (FRL & CR)
Syntrichia montana Nees + 10 (CRS)
S. papillosa (Wilson) Jur. + 16 (FRL & CR; first record for VC53 since 1912)
S. virescens (De Not.) Ochyra + 16 (FRL & CR)
Tetraphis pellucida Hedw. + 15 (NGH)
Ulota bruchii Hornsch. ex Brid. + 1 (CW)

Liverworts

Cololejeunea minutissima (Sm.) Schiffn. + 15 (on *Fraxinus*, Morkery Wood, 2009, NGH, **NCR**)
Frullania dilatata (L.) Dumort. + 1 (CW)
M. polymorpha ssp. *ruderalis* Bischl. & Boisselier + 1 (CW)
Pellia epiphylla (L.) Corda + 11 (FRL & CR)
Riccardia multifida (L.) Gray + 8 (FRL & CR)

Lichens

Arthonia radiata (Pers.) Ach. + 6 (MRDS, 2008)
Arthopyrenia punctiformis A.Massal. + 8 (On young *Fraxinus* in disused quarry, Welton-le-Wold, June 2009, MRDS, **NCR**)
Aspicilia contorta (Hoffm.) Kremp. + 11 (MRDS)
Belonia nidarosiensis (Kindt) P.M.Jørg. & Vězda + 14 (MRDS)
Botryolepraria lesdanii (Hue) Canals et al. + 14 (MRDS)
Caloplaca crenulatella (Nyl.) H.Olivier + 8 (MRDS)
Clauzadaea monticola (Ach.) Hafellner & Bellem. + 8 (MRDS)
Cyphelium inquinans (Sm.) Trevis. + 13 (MRDS), 14 (MRDS)
Diploschistis muscorum (Scop.) R.Sant. + 13 (MRDS)
Lecanora carpinea (L.) Vain. + 12 (MW)
L. horiza (Ach.) Linds. + 11 (On *Laburnum*, Gunby churchyard, June 2009, MRDS, **NCR**)
L. persimilis (Th.Fr.) Nyl. + 6 (MRDS, 2008), 14 (MRDS)
L. rupicola (L.) Zahlbr. + 11 (MRDS)
L. saligna (Schrad.) Zahlbr. + 18 (MRDS)
L. varia (Hoffm.) Ach. + 7 (MRDS)
Lecidella elaeochroma (Ach.) M.Choisy + 4 (MRDS), 12 (MW)
Parmotrema perlatum (Huds.) M.Choisy + 6 (JM), 7 (MRDS)
Ramalina fastigiata (Pers.) Ach. + 12 (MW)
R. lacera (With.) J.R.Laundon + 13 (Vertical face of gravestone, Thurlby churchyard, April 2008, MRDS, **VCR**), 15 (MRDS)

References

HILL, M.O., BLACKSTOCK, T.H, LONG, D.G. and ROTHERO, G.P. (2008) *A Checklist and Census Catalogue of British and Irish Bryophytes.* British Bryological Society, Middlewich.
SMITH, C.W., APTROOT, A., COPPINS, B.J., FLETCHER, A., GILBERT, O.L., JAMES, P.W. & WOLSELEY, P.A., eds (2009) *The Lichens of Great Britain and Ireland.* British Lichen Society, London.

MAMMALS

Chris J. Manning

In 2009, 1,447 records were entered into the mammal database. The most common species were brown hare *Lepus europaeus* (209), badger *Meles meles* (182), hedgehog *Erinaceus europaeus* (153 including 126 road casualties), mole *Talpa europaea* (140) and rabbit *Oryctolagus cuniculus* (138). Most records were of sightings (719) and road casualties (459). The only site with Chinese water deer *Hydropotes inermis* is Gibraltar Point but to date, it has evaded the efforts of photographers as a picture would be very useful to verify the record.

Four recorders provided more than 100 records during the year: Andrew Chick, Keith Robertson, Brian Hedley and Anne Goodall. Records were also collected from the Wildnews Bulletin and the Lincolnshire Bird Club forums. The most unusual report was of a prairie dog *Cynomys sp.* found in south Lincolnshire by

Julie Stoodley on 30th April 2009 - that shows the wide variety of pets people keep!

Nineteen fummards *Mustela putorius sp.* were recorded in 2009. A privately organised introduction of polecat using captive bred animals was proposed by Paul Slater, although so far he has declined to prepare a Biodiversity Action Plan for the species and elicit support for his proposals.

ACULEATE HYMENOPTERA

Michael Archer

The following are particularly important records.

Priocnemis coriacea Dahlbom – 4th record from Laughton Forest, A.L. Phillips.
Arachnospila spissa (Schiødte) – 4th record from Laughton forest, A.L. Phillips.
Odynerus spinipes (Linn.) – 8th record from Whisby Nature Park, A.L. Phillips.
Symmorphus bifasciatus (Linn.) – 6th and 7th records from Whisby Nature Park, A.L. Phillips and P. Porter.
Dolichovespula saxonica (Fab.) – 4th, 5th and 6th records from Laughton Forest, Saltfleetby-Theddlethorpe dunes and Willingham Woods by A.L. Phillips.
Stigmus pendulus Panzer – 1st record from Humberston Blow Wells, A.L. Phillips.
Cerceris arenaria (Linn.) – 5th, 6th and 7th records from Whisby Nature Park, A.L. Phillips and P. Porter, Laughton Forest, A.L. Phillips.
Andrena ovatula (Kirby) – 2nd and 3rd records from Whisby Nature Park, A.L. Phillips.
Lasioglossum fulvicorne (Kirby) – 2nd record from Irby Dales, A.L. Phillips.
Sphecodes niger von Hagens – 2nd record Whisby Nature Park, A.L. Phillips.
Megachile dorsalis Pérez – 1st record from Skegness, C.W. Watson.
Bombus hypnorum (Linn.) – 2nd, 3rd, and 4th records from Laughton Forest and Whisby Nature Park, A.L. Phillips and P. Porter.
Bombus barbutellus (Kirby) – 4th record from Dixon Wood, A.L. Phillips.

I would like to thank the following who submitted records or specimens to be identified: Alan Phillips, John Flynn, Phil Porter, C. Watson, Richard Davidson and Alan Dale via Alan Phillips, Alan Lazenby, Andrew Chick and R. and A. Parsons.

FIELD TRIP REPORTS 2009

South Thoresby chalk pit and South Thoresby LNR TF407776 and TF392762 26 April 2009
A visit to two sites led by Christine Rieser and Brian Hedley. There was a good turnout of 18 members on a lovely spring day who spent the first hour or two at a privately owned abandoned chalk pit at South Thoresby (TF407776). Here seepage of water from the soil above drained into a swallow hole leaving damp areas with abundant bryophytes. These included *Leskea polycarpa* with a good selection of epiphytes such as *Zygodon viridissimus* and *Metzgeria fruticulosa* and a number of calcicoles such as *Neckera complanata* and *Plagiomnium ellipticum*. Plants included early purple orchid, common twayblade, common spotted orchid, bee orchid, bluebell and wood anemone. Six butterfly species were noted including holly blue and comma. Later the group went to look at the recently formed South Thoresby Local Nature Reserve (TF392762) where imported soil had acquired large areas of common mosses. Plants included wild garlic, soft shield-fern and early forget-me-not. Muntjac deer also noted here.

Robert's Field (Lincolnshire Wildlife Trust reserve) TF000150 31 May 2009
10 members and one potential new member attended this field trip led by Annette Fualkner. An excellent introduction was given to the site by the Reserve Manager, Dave Vandome, who also provided us with a very useful species checklist.

In all 79 spp of flowering plants were recorded, including 7 new spp to add to the list - though it was quite early for some species, making identification difficult. A repeat visit later in the season would surely have added more to the list. Surprisingly, lepidoptera were thin on the ground with only low single numbers recorded of painted lady, common blue, and peacock. At an earlier visit on 28/5/09 a green carpet and several brown silver-lines moths were recorded, with a small number of grass moth spp. It is quite a windy site, but even in sheltered areas there were few butterflies or moths to be found.

Oxcombe TF3276 7 June 2009
Meeting led by Brian Hedley and Paul Kirby to this calcareous grassland SSSI, attended by 10 people despite heavy rain. Plantwise, high-lights included man orchid and four other orchid species, common milkwort, common restharrow, autumn gentian, stemless thistle, carline thistle and oval sedge.

A restricted range of bryophytes were noted and included *Amblystegium serpens*, *Hypnum resupinatum* and *Metzgeria furcata*.

Birds included calling quail plus buzzard, bullfinch and yellowhammer. One of the unexpected high-lights of the meeting was a gall found on salad burnet which was later confirmed by Graeme Clayton as being made by *Aceria sanguisorbae*. This is thought to be the first record for Lincolnshire. Many thanks to the landowner, Susanna Gorst, for allowing access.

Crowle Moor LWT Reserve SE7515 4 July 2009, mid-day to midnight.
Meeting led by Brian Hedley (afternoon) and Colin Smith (evening) and attended by nine people during course of day/evening. A very warm day with occasional light rain towards dusk.

A total of 14 butterfly species noted including 50-60 large heaths. Nine dragonfly

species noted including three common hawkers and 40 black darters.
An amazing total of almost 200 moth species were recorded using daytime searching methods and running 6 moth traps. Species included great oak beauty, Kent black arches, leopard moth, scallop shell, silver Y, miller, four-dotted footman, common lutestring, grey arches, beautiful yellow underwing, birds-wing, forester, six-spot burnet, pine hawk, oak egger, broken-barred carpet, fen wainscot, striped wainscot, large emerald and diamond-back moth.
Six mammal species were noted including four red deer and several common pipistrelle bats.
A good selection of 42 bird species were noted including two churring nightjars, two hobbies, a marsh harrier, singing tree pipits, a stonechat and a willow tit.
At least 143 plant species were noted including bog rosemary (at least 10 plants), cranberry, white sedge and greater yellow rattle.

Baston Fen /River Glen area TF1417 23 August 2009
LNU meeting led by Richard Chadd and Ian Cappitt attended by 8 people on a warm and dry afternoon. Involved a walk eastwards from Baston Fen along the River Glen and then back along Counter Drain.
At least 115 plant species were noted including large-flowered hemp-nettle, whorled water-milfoil, needle spike-rush, common meadow-rue, frogbit, water-violet, arrowhead, fan-leaved water crowfoot and an abundance of great horsetail as an arable weed. The stonewort, *Chara globularis*, was also noted. A restricted range of mosses were noted but did include *Syntrichia papillosa,* a rare species in Lincolnshire.
Twenty-seven bird species were noted including a brood of red-crested pochard, a kingfisher and two hobbies. Invertebrates noted were 10 dragonfly/damselfly species including red-eyed damselfly and abundant common darters and migrant hawkers. Nine butterfly species noted including several brimstones and painted ladies. Molluscs included painter's mussel and Lister's river snail. Water vole also noted.

Humberston TA3104 19 September 2009
Meeting to a private blow well site led by Brian Hedley and Colin Smith and attended by 12 people on a warm and dry afternoon/evening (12.00 to 22.30) Coincided with National Moth Night. Many thanks to the landowners for allowing access.
Over 90 plant species noted including native black poplar (3 specimens) and blunt-flowered rush. A restricted bryophyte list was made but did include *Orthotrichum diaphanum, Ulota phyllantha and Zygodon conoideus.*
Mammals included common pipistrelle bat (10-15), noctule bat and frequent water vole signs. Thirty six bird species were noted including tawny owl, little owl, yellow wagtail and bullfinch. Seven butterfly species recorded including holly blue (caterpillar) and comma. Moths included 20 species noted during the day and a further 23 species to light including twin-spotted wainscot, diamondback moth, sallow and frosted orange.
Other invertebrates recorded included two noteworthy bugs (Heteroptera): *Anthocoris limbatus* was the first LNU record for the county and *Piesma quadratum* was the third county record, the others being at Donna Nook and Saltfleetby. The solitary wasp *Stigmus solskyi* was also recorded.

TRANSACTIONS OF THE LINCOLNSHIRE NATURALISTS' UNION

Officers of the Union in 2009
(Year of election to the Executive Committee)

President Chris Manning (2001)
President elect Ken Rowland (2009)
Honorary Secretary Margaret Haggerty (2006)
Honorary Treasurer Ian MacAlpine-Leny (2001)
Membership Secretary via LWT
Publicity Secretary Vacant
Programme Secretary Ashley Butterfield (2006) (winter) and Brian Hedley (2007) (summer)
Editor of Transactions Nick Tribe (2004)
Auditor Emma Murray (Nicholsons)

Executive Committee Ian Cappit (2005), Richard Chadd (2002), Brian Hedley (2007), Neil Pike (2009), Phil Porter (2008)

External representatives Lincolnshire Biodiversity Partnership Ian MacAlpine-Leny, Lincolnshire Bird Club Committee Ian MacAlpine-Leny, Lincolnshire Wildlife Trust Biodiversity Team Richard Chadd, Local Wildlife Sites Panel, Richard Chadd

Section Recorders

Ants, wasps & bees Dr Michael Archer	**Bats** Mrs Annette Faulkner and Ms Caroline Tero
Beetles Dr Roger Key	**Bryophytes/lichens** Professor Mark Seaward
Butterflies Mr Allan Binding	**Dragonflies** Mr Richard Chadd
Fish Mr Nick Bromidge & Mr Ian MacAlpine-Leny	**Flies** Mr Andrew Godfrey
Freshwater invertebrates Mr Richard Chadd	**Fungi** Mr Ray Halstead
Grasshoppers, etc. Mr Brian Redman	**Geology** Mr David Robinson
Higher plants Mr Paul Kirby	**Isopods & myriapods** Mr Neil Pike
Macro moths Mr Colin Smith	**Mammals** Mr Chris Manning
Micro moths Mr Colin Smith	**Molluscs** Mr John Redshaw
Plant Galls Mr Graeme Clayton	**Pseudoscorpions** Mrs Annette Binding
Sawflies Dr David Shepphard	**Spiders** Mrs Annette Binding
Shield bugs Mrs Annette Binding	**True bugs** Mr Colin Smith

SECRETARY'S REPORT

Margaret Haggerty

2009 has been another successful year for the LNU, with membership still edging up. The Executive Committee met four times over the year, there were seven field meetings held around the county, and three indoor meetings as well as the annual Recorders' Meeting.

The LNU continues to have active representation within other organisations, including Lincolnshire Biodiversity Partnership, Lincolnshire Bird Club Committee, Lincolnshire Wildlife Trust Biodiversity Team and the Local Wildlife Sites Panel. A Local Geological Sites Panel has also recently been established.

There are seven field meetings planned for 2010, including a joint event with the British Dragonfly Society. This will help to provide records for the new atlas (see article in Communiqué).

The indoor and outdoor meetings and events are an excellent opportunity to raise the profile of the LNU, and encourage more people to join and take part in biological recording.

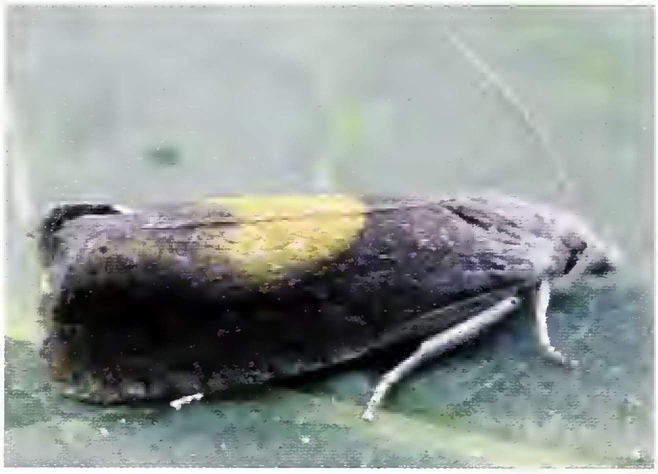
I am standing down after three years as Secretary (and four years on the Exec) following the birth of our first child, Penelope Abigail. I have enjoyed my time in helping with the organisation of the LNU, and I wish my successor and the rest of the Exec the best of luck for the future.

Meetings in 2009

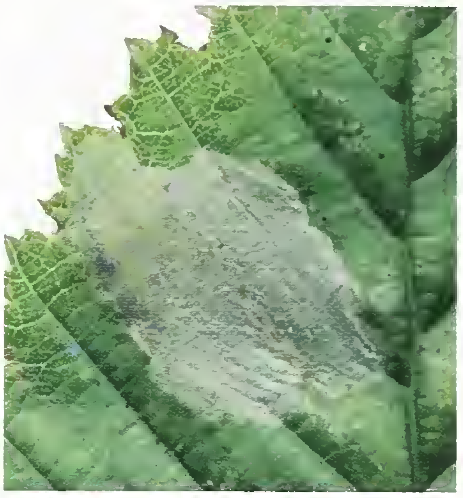
Saturday 24th January Talk by Oliver Rackham 'The history of the countryside'
Saturday 21st February Recorders' meeting
Saturday 21st March LNU AGM and Presidential Address from Chris Manning 'Mammal Review and Atlas Update: A century of recording, progress and opportunities'

704th field meeting	Sunday 26th April	South Thoresby Pit and South Thoresby Warren LNR
705th field meeting	Sunday 31st May	Robert's Field LWT Reserve
706th field meeting	Sunday 7th June	High Barn SSSI, Oxcombe
707th field meeting	Saturday 4th July	Crowle Moor LWT reserve
708th field meeting	Sunday 23rd August	River Glen west of Spalding
709th field meeting	Sat. 19th September	Blow Wells near Humberston
710th field meeting	Sun. 16th October	Roughton Moor Wood LWT reserve

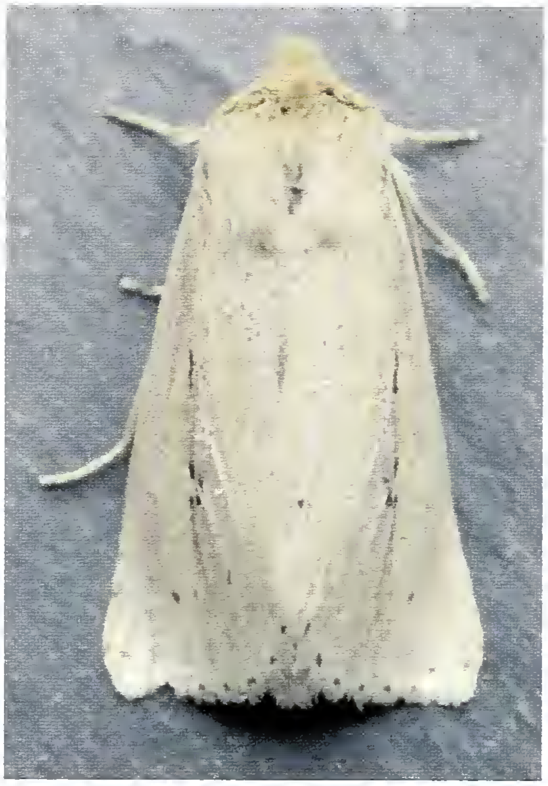
Saturday 14th November Talk by Roger Key 'Williwaws and wildlife – hunting for aliens in Antarctic South Georgia'



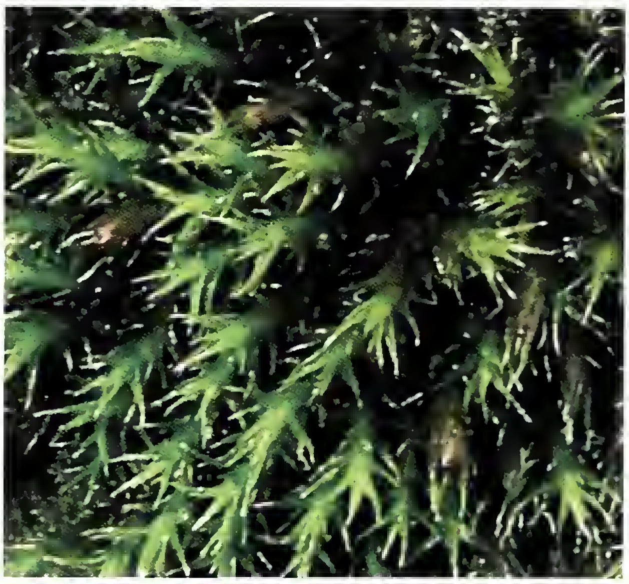
Dichrorampha alpinana Photo M. Gray

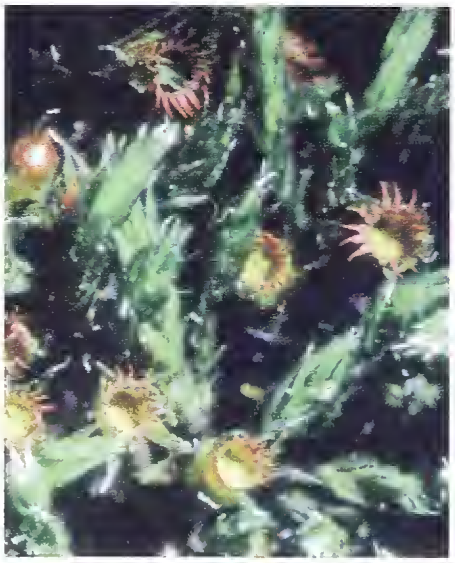


Phyllonorcyter esperella leaf mine
Photo M. Gray



Webb's wainscot Photo M. Gray





Schistidium crassipilum Photos C. Rieser

Contributing to *The Lincolnshire Naturalist*

We are constantly on the lookout for full length articles or short notes, even a few lines which can be useful space fillers, on any aspect of our natural history, current or historic. Consider a note in *The Lincolnshire Naturalist* for any new or significant observations. Articles should be typed. It would help the editor tremendously if they could either be e-mailed or sent on CD or floppy disk with accompanying paper copy, in Word© or Word Perfect© format. Drawings, colour or black & white photographs, colour transparencies or negatives (please include a print) can be included. If you submit your own photographs, take them or scan them at a resolution of at least 200 dots per inch and at a size equal to or larger than the size they will be printed at (approximately 11.5x7.5cm). Colour illustration may be rendered to black and white. Please give a caption. Illustrations will be returned and edited text resubmitted to the author for approval and proof-reading before publication.
Convention adopted for names - Latin names should be *italicised*, **not** (bracketed) nor underlined and should follow the English name (where applicable) with no separating comma. English names should start with lower case letters unless incorporating other names warranting capitalisation (eg Brandt's bat).

References to journals and books should please be as below. Please note and use the capitalization and italic convention.
WOODRUFFE-PEACOCK, Rev E.A., 1900. The Lincolnshire Naturalists at Freiston. *The Naturalist*, **25**: 141-144.
DUDDINGTON, J. & JOHNSON, R. 1983. *The Butterflies and Larger Moths of Lincolnshire and South Humberside*. Lincolnshire Naturalists' Union. Lincoln. 299pp.

The final copy date is **31st March** of the year in which the Transactions are to be issued. Please contact the editor directly if there is difficulty in meeting this deadline. If in any doubt as to whether your observation merits a note or an article, or you have any other queries please do get in touch with the editor c/o Lincolnshire Naturalists' Union, Lincolnshire Wildlife Trust, Banovallum House, Horncastle, LN9 5HF to whom texts should be sent. A guidance note is available and is sent out to recorders. Otherwise, please attempt to imitate the format in this issue of the Lincolnshire Naturalist.

EDITORIAL

Nick Tribe

Welcome to another edition of The Naturalist

Along with the well-deserved ‘thank you’ to established contributors I would like to welcome ‘new’ contributors such as Alan Phillips, John Aram and Ray Halstead to the team. Communication is at the heart of what the LNU is about and I hope that your articles help stimulate interest in recording in your areas of expertise.

This edition contains 3 long articles containing ‘checklists’. These articles provide an excellent ‘snap shot’ of the state of recording in the county in 2009. I hope they prove to be of use to future readers as well as promoting understanding and interest among the current readership.

THE LINCOLNSHIRE NATURALIST
including
Transactions of the Lincolnshire Naturalists' Union
for 2009
Volume 27, Part 3, 2010

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cover picture roe deer (Photo: Robert Hardy) Line illustration from Natural England